

APPENDIX D-21  
FIRE PROTECTION PLAN  
OTAY RANCH RESORT VILLAGE 13 – ALTERNATIVE H

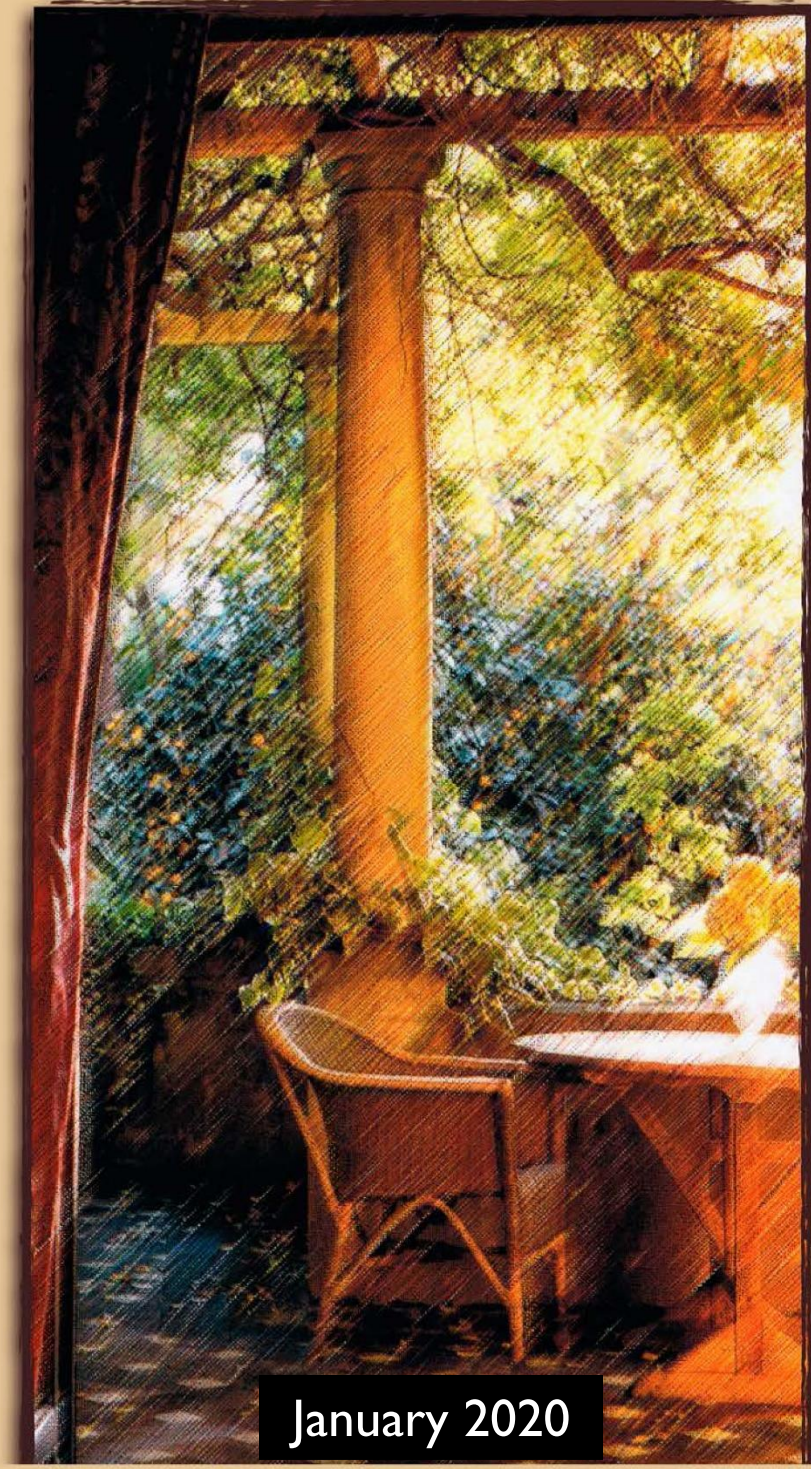
JANUARY 2020

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# OTAY RANCH RESORT VILLAGE



January 2020

# FIRE PROTECTION PLAN





**FIRE PROTECTION PLAN**  
for the  
**THE OTAY RANCH RESORT VILLAGE**  
**ALTERNATIVE H PROJECT**  
**Environmental Log No. PDS2004-04-19005**  
**SCH No. 2004101058**

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**County of San Diego**  
**Planning & Development Services**

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**JANUARY 2020**



**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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# **Fire Protection Plan**

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### **ACRONYMS AND ABBREVIATIONS**

<b>Acronym/Abbreviation</b>	<b>Definition</b>
AMSL	Above Mean Sea Level
DPW	San Diego County Department of Public Works
EIR	Environmental Impact Report
FAHJ	Fire Authority Having Jurisdiction
FMZ	Fuel Modification Zone
FPP	Fire Protection Plan
GIS	Geographical Information System
GDP	General Development Plan
HOA	Homeowner's Association
MSCP	Multiple Species Conservation Program
NFPA	National Fire Protection Association
SDCFA	San Diego County Fire Authority
WUI	wildland/urban interface

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# **Fire Protection Plan**

## **The Otay Ranch Resort Village - Alternative H Project**

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### **EXECUTIVE SUMMARY**

This Fire Protection Plan (FPP) has been updated for the Otay Ranch Resort Village Environmental Impact Report (EIR) Alternative H (Alternative H) in the unincorporated portion of San Diego County, California. This FPP provides measures for fire protection which meet the 2017 San Diego County Consolidated Fire Code, or meets the intent of the code. It also identifies and evaluates the fire risk associated with Alternative H's proposed land uses, and identifies requirements for fuel modification, building design and construction and other pertinent development infrastructure criteria for fire protection. The primary focus of this FPP is providing an implementable framework for suitable protection of the planned structures and the people living and utilizing them. Tasks completed in the preparation of this FPP include data review, code review, site fire risk analysis, land use plan review, fire behavior modeling, and site specific recommendations.

Where possible, this FPP incorporates principles of sustainability that are an important component of Alternative H. Preservation and conservation of resources, including native plant communities, energy and water, along with conservation and maintenance of the site's aesthetics, are important components of Alternative H and have been duly considered and integrated in this FPP, where appropriate.

Alternative H comprises approximately 1,869 acres and is designated for the development of a resort and residential community with adjacent, open space preserve. It is located in southern San Diego County near the City of Chula Vista, east of Interstate 805. At build-out, Alternative H will include approximately 693 developed acres and approximately 1,176 acres of preserved and managed open space. The Otay Ranch Resort Village - Alternative H project will be built in phases and will include 1,881 single-family homes and 57 multi-family units, resort uses, retail/commercial, a public safety site, an elementary school site, park and recreation facilities, and related water, sewer, electrical and roadway infrastructure necessary within a planned community. Fire service would be provided by San Diego County Fire Authority (SDCFA) from a proposed centrally located, on-site station that is capable of responding to the entire project within the San Diego County's General Plan 5 minute travel time standard.

The structures in Alternative H will be built using ignition resistant materials per the most recent County Fire and Building Codes (Chapter 7A) which are the amended California Fire and Building Codes and will be complemented by a system of improved water availability, capacity and delivery; fire department access; monitored defensible space/fuel modification; interior fire sprinkler systems in all structures, monitored interior sprinklers in applicable structures; and other components that will provide properly equipped and maintained structures with a high level of fire ignition resistance.

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The site fire risk analysis resulted in the determination that wildfire has occurred and will likely occur on and near the Alternative H site again, but with moderate overall intensity and with the ability to provide local fire fighters needed defensible space given implementation of specified measures. Based on sophisticated modeling and analysis of the Alternative H site to assess its unique fire risk and fire behavior, it was determined that the California and San Diego County standard of 100-foot-wide fuel modification zones will be suitable for anticipated fire intensity and will include an additional approximately 20 feet within the rear and/or side yards for perimeter lots. This 120-foot wide fuel modification zone, when properly maintained as it will be with this community, has proven effective at minimizing structure ignition in recent fire events in the San Diego region, especially when coupled with ignition resistant construction. The 100 foot wide fuel modification zone that starts at property boundaries will be maintained in perpetuity by a funded Community Facilities District or Homeowner's Association (or similarly funded entity), ensuring that the required fuel reduction work occurs annually. The 20 foot rear and/or side yard zones will be maintained by private homeowners. Both the HOA managed areas and the privately owned areas will be inspected by SDCFA or a qualified 3<sup>rd</sup> party fuel modification inspector annually.

Early evacuation for any type of wildfire emergency at the Alternative H site is the preferred method of providing for resident safety, consistent with the SDCFA's current approach for evacuation. As such, the Alternative H's Homeowner's Association will formally adopt, practice, and implement a "Ready, Set, Go!" (International Fire Chiefs Association 2013) approach to site evacuation. The "Ready, Set, Go!" concept is widely known and encouraged by the state of California and most fire agencies, including SDCFA. Pre-planning for emergencies, including wildfire emergencies, focus on being prepared, minimizing potential for errors, maintaining the site's fire protection systems, and implementing a conservative (evacuate as early as possible) approach to evacuation and site uses during periods of fire weather extremes.

Based on the results of this FPP's analysis and findings, the following FPP implementation measures will be provided by Alternative H as part of the proposed development plan. These measures are discussed in more detail throughout this FPP.

1. Preparation of a Construction Fire Prevention Plan detailing the important construction phase restrictions and fire safety requirements that will be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.
2. Alternative H buildings will be constructed of ignition resistant construction materials based on the latest Building and Fire Codes.
3. Fire resistive landscaping per County of San Diego standards will be provided throughout the development.

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4. Fire apparatus access roads will be provided throughout the community and will vary in width and configuration, but will all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances.
5. Firefighting staging areas/temporary refuge areas are available along roadways and site green spaces.
6. Water capacity and delivery provide for a reliable water source for operations and during emergencies requiring extended fire flow.
7. The Community Homeowner's Association (HOA) will include an outreach and educational role to coordinate with SDCFA and the local Fire Safe Council, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, educate residents on and prepare community-wide "Ready, Set, Go!" plans.

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**The Otay Ranch Resort Village - Alternative H Project**

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# Fire Protection Plan

## The Otay Ranch Resort Village - Alternative H Project

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## 1 INTRODUCTION

### 1.1 Purpose

This Fire Protection Plan (FPP) has been prepared by Dudek for the Otay Ranch Resort Village -EIR Alternative H., Dudek Fire Protection Planners have reviewed the Village EIR Alternative H to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. This FPP for Alternative H also includes updated information contained in the *Otay Ranch Resort Village Fire Protection Plan* (January 2015) in response to comments on the Draft EIR. This plan generates and memorializes current fire safety requirements of the Fire Authority Having Jurisdiction (FAHJ), which is the San Diego County Fire Authority (SDCFA). Requirements and recommendations are based on site-specific Alternative H characteristics and incorporate input from Otay Ranch Resort Village applicant and the FAHJ.

### 1.2 Scope

This FPP will guide the design, construction, and maintenance of Alternative H related improvements in compliance with applicable codes. When properly implemented on an ongoing basis, the requirements and recommendations detailed herein are designed to result in reduced fire risks to the Alternative H site. To that end, preparation of this FPP reflects completion of the following tasks:

- Gather site specific climate, terrain, and fuel data;
- Process and analyze the data using the latest GIS technology;
- Predict fire behavior using scientifically based fire behavior models (BehavePlus and FlamMap), comparisons with actual wildfires in similar terrain and fuels, and experienced judgment;
- Analyze and guide design of proposed infrastructure;
- Analyze the existing emergency response capabilities;
- Assess the risk associated with the Alternative H site;
- Review and incorporation of the FAHJ Fire Codes
- Incorporation of Alternative H specific recommendations.

An additional field observation was conducted to augment previous site assessments to re-confirm fire behavior modeling and formulating new recommendations presented in this FPP.

# **Fire Protection Plan**

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### **1.3 Applicable Codes**

This Plan demonstrates compliance with 2017 San Diego County Consolidated Fire Code requirements. It also demonstrates compliance with the requirements detailed in Title 24, Part 2 – 2016 California Building Code, Part 2.5 – 2016 California Residential Code, and Part 9 – 2016 California Fire Code for new development in the wildland-urban interface (WUI). It is also consistent with applicable County requirements for fire protection plans and vegetation management plans.

Per County Consolidated Fire Code, Section 104.8, Modifications,

“Whenever there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided the fire code official shall first find that special individual reasons make the strict letter of this code impracticable and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The applicant’s request for a modification shall state the specific sections(s) for which a modification is requested, material facts supporting the contention of the applicant, the details of the modification or mitigating measure proposed and, if applicable, a map showing the proposed location and siting of the modification or mitigation measure. The details of action granting modifications shall be recorded and entered into the files of the department of fire prevention.”

This FPP includes modifications to the applicable code where strict application of the code cannot be provided and in such cases, provides information supporting fire authority findings.

# **Fire Protection Plan**

## **The Otay Ranch Resort Village - Alternative H Project**

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## **2 PROPOSED ALTERNATIVE H SUMMARY**

### **2.1 Location**

The Alternative H site consists of approximately 1,869 acres located in southwestern San Diego County, approximately 0.25 miles east of the City of Chula Vista (Figure 1, Regional Map and Figure 2, Alternative H Site Location)). The Alternative H area lies within the watershed of the Otay River, a westerly flowing stream that drains an area of approximately 145 square miles. The site is upstream of Savage Dam, which creates Lower Otay Reservoir. The Alternative H site is bordered by Lower Otay Reservoir to the south and west. Regional access is provided by Interstate 805 (I-805), approximately 7 miles west of the site and State Route 125 (SR-125) located approximately 2.5 miles west of the Alternative H site. State Route 54 (SR-54) provides regional east-west circulation, approximately 5 miles north of the Alternative H site. Local access is via Telegraph Canyon Road, which transitions into Otay Lakes Road, as an arterial road that forms the southern boundary of the Alternative H site. The property is located on the United States Geological Survey (USGS) Jamul Mountains Quadrangle, Sections 4, 5, 6, 31, 32, 33; Townships 16 South and 17 South, and Range 1 East.

The Alternative H Assessor Parcel Numbers are 595-090-03, 598-130-021, 598-130-03, 598-140-01, 647-020-08, 647-020-09, 647-020-12, and 647-030-05.

#### **2.1.1 Vicinity Land Use**

Existing land uses surrounding the Otay Ranch Resort Village - Alternative H site vary from open water to highly urbanized areas (Figure 3, Surrounding Land Uses). Lower Otay Reservoir, a water and recreation reservoir owned by the City of San Diego, is located to the west and south of the Alternative H site. The Eastlake Vistas residential community, the Eastlake Woods residential community and the U.S. Olympic Training Center compose the edge of urban development to the west. Lower Otay Reservoir, a recreational reservoir and water supply owned by the City of San Diego, is located to the south and west of the Alternative H site. Upper Otay Reservoir and the Birch Family Estate Parcel, a portion of the Otay Ranch Resort Village Alternative H identified for possible future development as a specialty conference center and low-density residential use, are located to the northwest. A parachute training facility and airstrip is located on a private airfield (John Nichols Airfield) owned by the City of San Diego at the east end of Lower Otay Reservoir, and an inactive quarry is located farther to the east of the project site. Existing open space preserve land is located north of the Alternative H area.

Prior to 2001, the southern half of the Alternative H area was used for ranching, specifically cattle grazing. Crop cultivation likely occurred on the southwestern corner of the property decades ago. The site is bounded on the south by Otay Lakes Road and Jamul Creek is located just east of the eastern boundary. Lower Otay Reservoir (which is owned by the City of San Diego) is located south of the

## **Fire Protection Plan**

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site; open space in the Jamul Mountains is adjacent to the site in the north and east (which is owned by the U.S. Bureau of Land Management (BLM) and private parties).

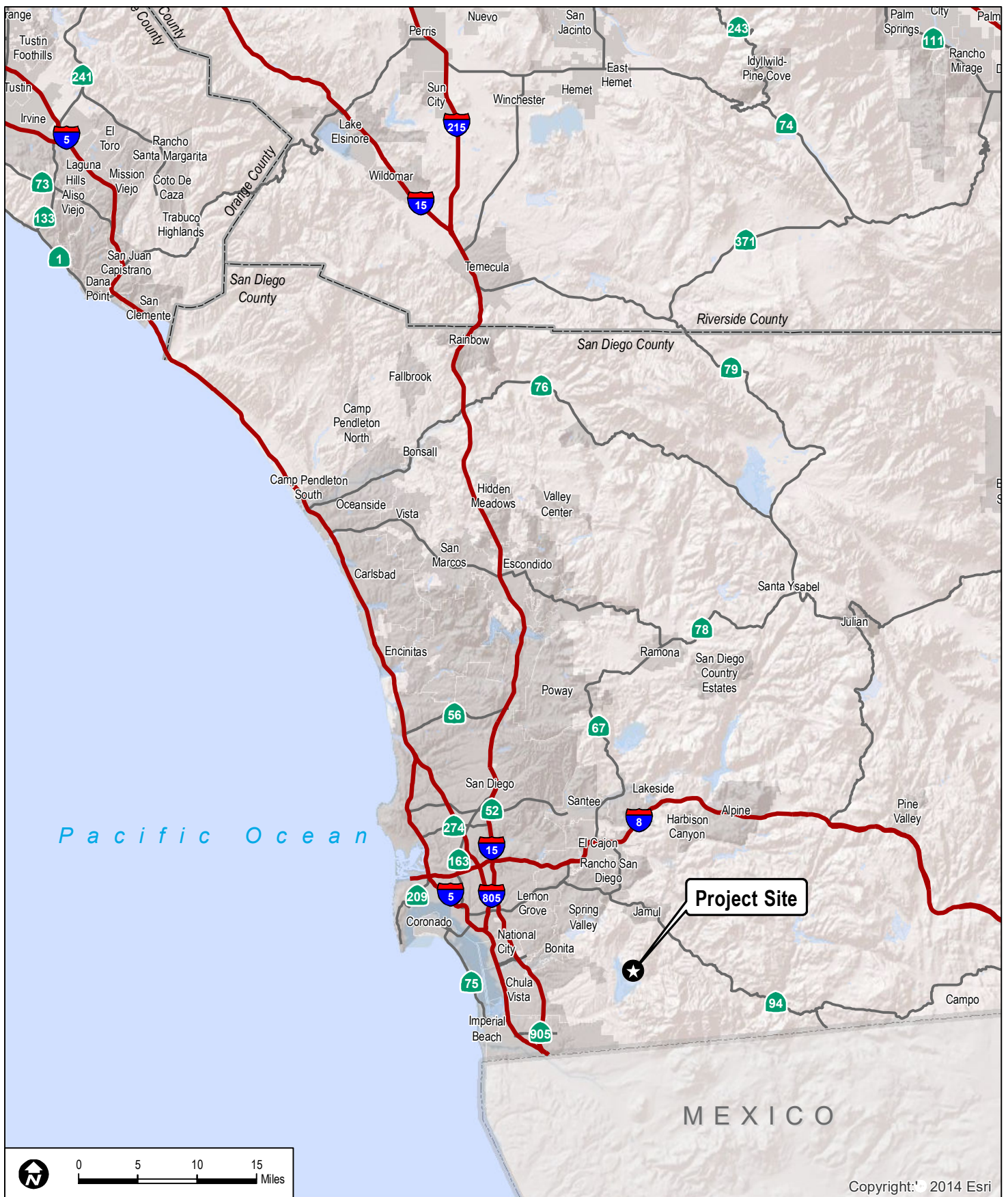
## **2.2 Alternative H Description**

Under Alternative H, the 1,869-acre project site would be developed in accordance with the approved Preserve and development boundaries shown in the MSCP County Subarea Plan. Development of the project site would consist of 1,881 single-family homes and 57 multi-family homes for a total of 1,938 homes. Resort uses would encompass 16.6 acres in the southeast portion of the project site and includes up to 200 rooms and 20,000 square feet of ancillary retail/commercial uses. A total of 25.1 gross acres of parkland would be provided, which includes a central park in the village core and five neighborhood parks within convenient walking distance from all homes. A 10.1-acre elementary school is proposed adjacent to the central park. While no public safety site was included within Village 13 in the Otay SRP, which located a fire station in Village 15, as with the Proposed Project this alternative would include a 2.3-acre Public Safety Site. This alternative also proposes a community homeowner facility (6.1 acres), located in close proximity to the village core, which includes meeting space and fitness center, recreation courts, a swimming pool and picnic areas. Otay Lakes Road would remain in its existing location and would undergo improvements including a widening from two to four lanes between the City/County Boundary and Driveway #2. Alternative H would convey 1,107 acres to the Otay Ranch RMP Preserve and designate 69.3 acres of additional habitat land as Conservation Open Space. Additionally, 76.5 acres would be used for manufactured open space, which consists of homeowner association maintained manufactured slopes, water basin lots, and fuel management zones. Other land uses include 32.3 acres for internal circulation.

An HOA maintained 100-foot Fuel Modification Zone (FMZ) along with a homeowner maintained 20-foot wide rear or side yard FMZ is provided at the Alternative H perimeter, as well as a minimum 120-foot FMZ for all structures adjacent to the Thornmint Preserve in the southwest portion of the Alternative H Site Plan. Structures that back the Vernal Pool Preserve (OS Lot E) in the southeast corner of the Alternative H do not include 100 feet of FMZ and will be protected by a 6-foot high view wall and 30-feet of FMZ as described in Section 7.1.

### **2.2.1 Resort**

A resort hotel complex of approximately 16.6 acres with up to 200 rooms will be built in the southeastern portion of the Alternative H site. Buildings may be one to three stories tall with iconic architectural elements, such as a bell tower, up to 75 feet possible. No habitable structures on the Resort site will be over three stories in height. Designers will coordinate with SDCFA to ensure that the buildings are designed such that typical 24-foot tall firefighter ground ladders will provide effective access.



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**FIGURE 1**  
**Regional Map**

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

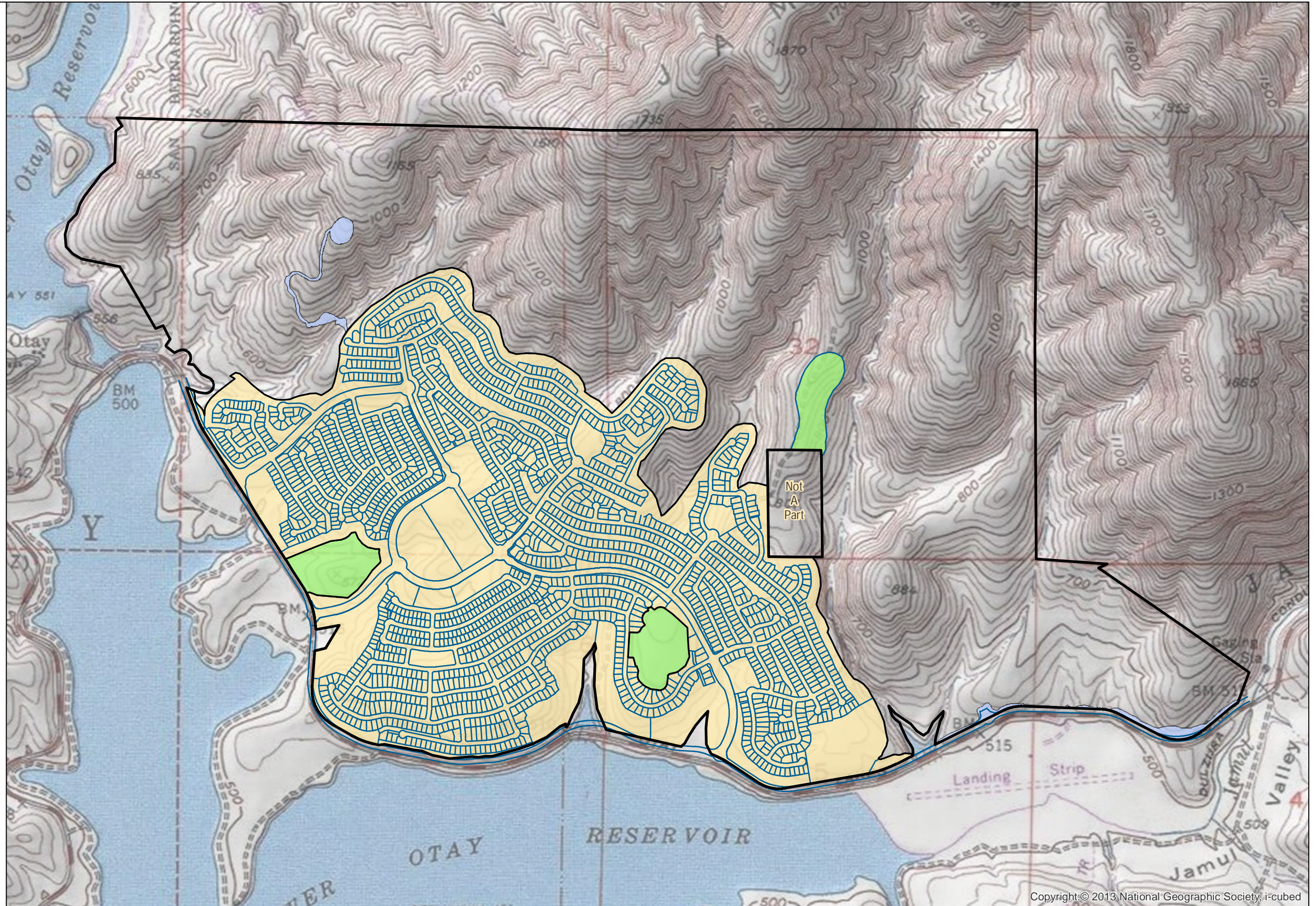
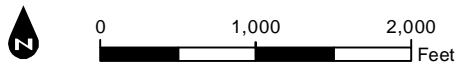
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- Project Site
- Development Footprint
- Potential Preserve
- Allowable Use (Roads and Water Tank)



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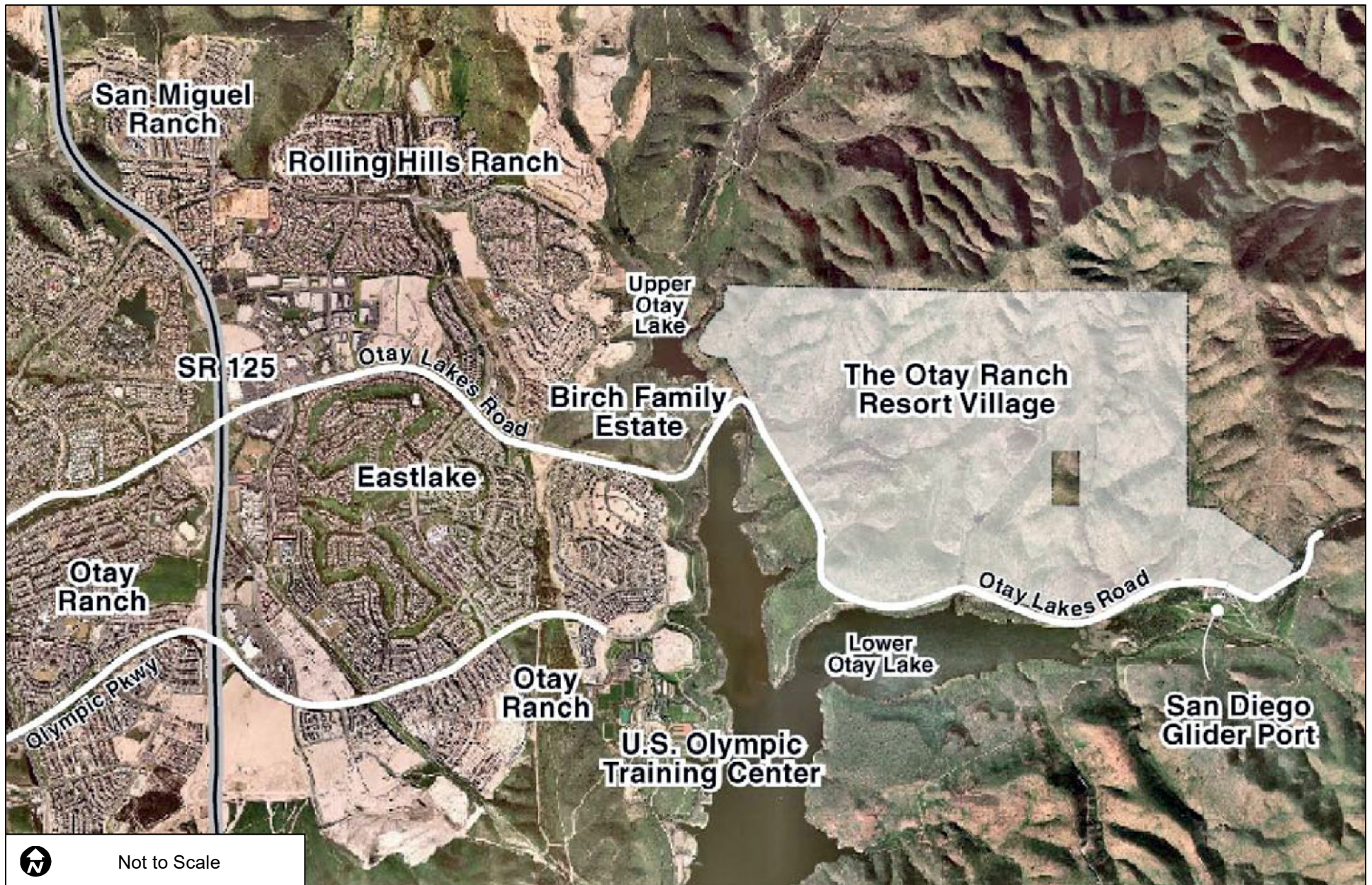
SOURCE: BASEMAP - USGS; DESIGN - HUNSAKER AND ASSOCIATES 2018

**FIGURE 2**  
**Alternative H Site Location Map**

Otay Ranch Resort Village – Alternative H Fire Protection Plan



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**FIGURE 3**

**Surrounding Land Uses**

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

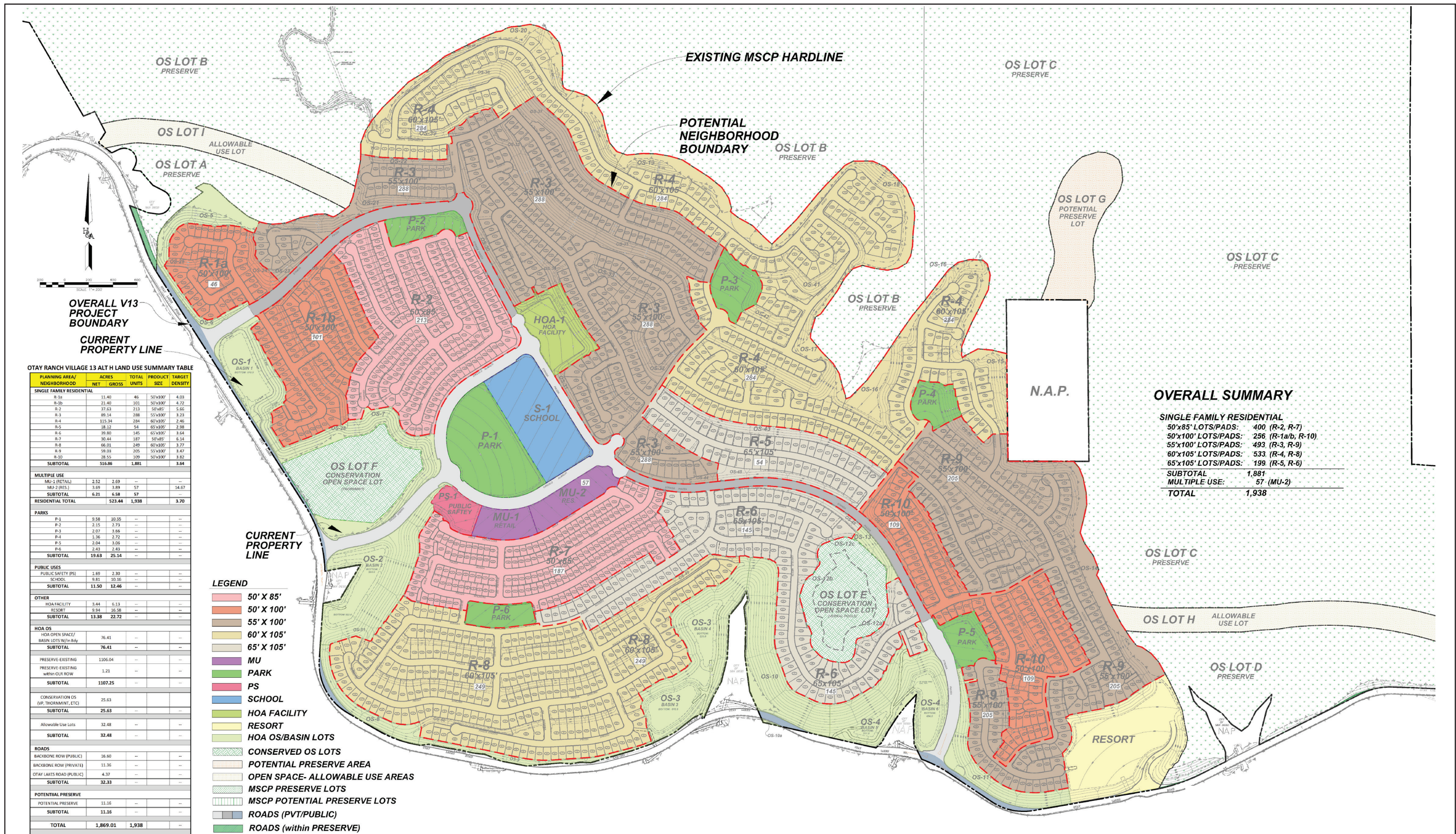


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SOURCE: HUNSAKER AND ASSOCIATES, INC. 2018

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FIGURE 4  
Otay Ranch Resort Village EIR Alternative H Land Uses Map

Otay Ranch Resort Village – Alternative H Fire Protection Plan



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## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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The resort complex may include up to 20,000 square feet of commercial uses such as restaurants, retail stores, offices and conference facilities, and other recreational facilities, such as tennis and swimming facilities. The commercial portion of the resort complex may provide day-to-day services for permanent residents and visitor-oriented attractions.

#### **2.2.2 Residential**

Approximately 516.9 acres (28%) of the Alternative H area are designated single-family residential and will include 1,881 single-family dwelling units. A 6.6-acre multiple-use site, which consists of retail uses and 57 multi-family units, would be centrally located in the Village Core, along the eastern end of Circulo Almalfi, just east of Otay Lakes Road at the second Alternative H entry (Piazza Urbino). The gross density of the Alternative H site is approximately 3.7 dwelling units per acre.

#### **2.2.3 Public Uses**

A 10.10-acre elementary school site and a 10.6-acre public park are proposed within the village core. Five other parks, ranging in size between 2.4 and 3.7 acres, would be located throughout the residential neighborhoods. A community HOA facility site of 6.1 acres, which includes meeting space and fitness center, recreation courts, swimming pool and picnic areas, would be located in close proximity to the village core.

#### **2.2.4 Public Safety Site**

While no public safety site was included within Otay Ranch Resort Village in the Otay Subregional Plan (Otay Ranch 1993), which located a fire station in Village 15, as with the proposed Alternative H, this alternative would include a 2.3-acre Public Safety Site centrally located in the Village Core, adjacent to the proposed Multi-Use site, with access allowing travel north, south, west, and east. The public safety site will be reserved on the appropriate Final Map, depending on the final fire service configuration. Details related to funding, phasing, specific fire station facility components, equipment and staffing are discussed in Section 6.0 of this FPP.

#### **2.2.5 Otay Ranch Preserve**

The largest component of open space in the overall Otay Ranch Resort Village - Alternative H is the Otay Ranch RMP Preserve, described in detail in the Otay Ranch Resource Management Plan. Development of the Alternative H Specific Plan area requires conveyance of open space to the Preserve Owner/Manager. The Alternative H site plan includes 1,107 acres of Preserve land. Native plant communities, primarily coastal sage scrub, populate the Preserve areas. Additional

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### **The Otay Ranch Resort Village - Alternative H Project**

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conservation lots totaling 69.3 acres within the interior open space areas will be conserved for habitat protection of thornmint, vernal pools, and the Quino Checkerspot Butterfly.

#### **2.2.6 Non-Preserve Open Space**

The 76.4 acres of non-preserve open space within the developed portions of the Otay Ranch Resort Village – Alternative H are comprised of HOA and water basin lots. The non-preserve open space areas will be planted with irrigated, approved, fire resistive landscape plantings and maintained on an ongoing basis by the HOA, in perpetuity, as detailed in this FPP.

#### **2.2.7 Other Land Uses**

Other land uses include 32.4 acres for internal circulation roads.

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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## **3 PROPOSED ALTERNATIVE H STUDY AREA RISK ANALYSIS**

### **3.1 Field Assessment**

Following review of available digital Study Area information, including topography, vegetation types, fire history, and Alternative H's Development Footprint, Dudek fire protection planners conducted initial field assessment of the Study Area on September 2015 and again in April 2018 to evaluate potential wildfire risks associated with the Alternative H development footprint. The Fire Protection Planners' assessment was aided by Dudek's biologists who conducted a comprehensive vegetation mapping assignment on the Study Area over the course of several weeks in 2015 and 2018 (Dudek 2015 and 2018).

Among the field tasks completed were the following:

- Vegetation estimates and mapping refinements;
- Fuel load analysis;
- Topographic features documentation;
- Photograph documentation;
- Confirmation/verification of hazard assumptions; and
- Ingress/egress documentation.

Study Area photographs were collected (Appendix A) and fuel conditions were mapped using aerial images. Field observations augmented existing Study Area data in generating the fire behavior models and formulating the requirements provided in this FPP.

### **3.2 Site Characteristics and Fire Environment**

The following sections discuss the characteristics of the Alternative H Study Area at a regional scale. Evaluating conditions at this macro-scale provides a better understanding of the regional fire environment, which represents the fuel bed for wildfires that may ignite in the vicinity of, and burn toward, the Alternative H's planned and maintained fire buffers, landscapes, and ignition resistant structures.

#### **3.2.1 Topography**

Site topography is characterized by a broad mesa sloping to the south, broken by several steep canyons generally draining from north to south (Figure 5, Site Topography and Vegetation Map).

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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Portions of the relatively flat mesa extend north into the Jamul Mountains, where the terrain is primarily characterized by steeper slopes. The southern half of the site also contains three large mesas. Drainages bisect the mesas and generally run north to south, with exception of one drainage running east to west from the center to western edge of the property. Several stock ponds have been intentionally created along the drainages on the property.

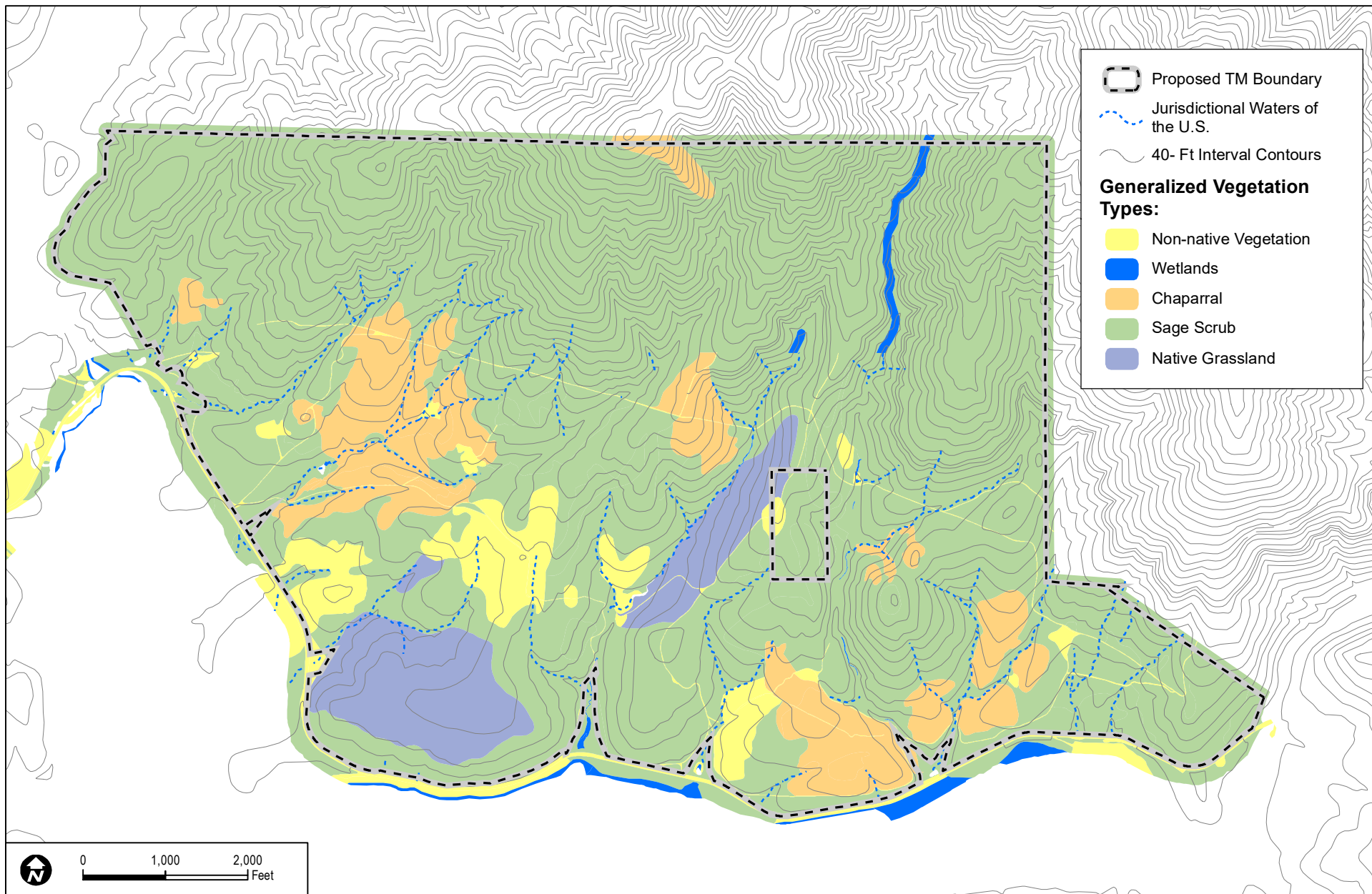
Elevations of developed portions of the Alternative H area range from approximately 500 feet above mean sea level (AMSL) at the southern end of the property to approximately 900 feet AMSL in the northeastern portions. Open space within the Alternative H area includes elevations up to approximately 1,500 feet AMSL.

The site's average slope is approximately 44%. Slope is important relative to wildfire because steeper slopes typically facilitate more rapid fire spread. In the case of the Alternative H site, the steeper slopes are primarily within the areas designated as permanent open space preserve and will not be developed. The site's steeper slopes ascend from south to north, away from the developed areas of the Alternative H in the alignment of the extreme Santa Ana wind events, which influences fire spread as fires tend to spread slower downslope.

#### **3.2.2 Vegetation**

The Alternative H area is currently undeveloped and is dominated by coastal sage scrub (CSS), with substantial representation of grassland and chaparral (Figure 5). Some riparian vegetation occurs in Alternative H site drainages. More detailed information regarding the site's plant communities is provided in the *Otay Ranch Resort Village Biological Resources Technical Report, San Diego County, California* (Dudek 2015). Extensive vegetation type mapping is useful for fire planning, because it enables each vegetation community to be assigned a fuel model, which is used by a software program to predict fire characteristics, as discussed in Section 5.1.

This vegetation is adapted to periodic wildfire events. Fire history data described in Section 3.2.4 indicates that the vegetation last burned in 2003 (Mine/Otay Fire) and is naturally recovering from this wildfire. Additionally, portions of the site have been historically mechanically disturbed by farming and grazing activity, reducing the presence of natural vegetation. On site vegetation is important relative to wildfire as some vegetation, such as CSS and grassland habitats, are highly flammable while other vegetation, such as oak and sycamore riparian, is less flammable due to its higher moisture content, but will burn under certain, more intense fire conditions.



Source: Dudek 2015; SANGIS 2015

**DUDEK**

**FIGURE 5**  
**Site Topography and Vegetation Map**

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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## **Fire Protection Plan**

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The Alternative H development footprint would be converted to roads, structures, and landscape vegetation. Any native vegetative fuels within FMZs will also be modified as a result of development, altering their current densities, distributions, and species composition. Areas within the most influential sphere of influence for direct fire affects (approximately 300 feet outside of proposed development) and FMZs will continue to be dominated by sage scrub and grassland fuel beds. These fuel types are anticipated to remain in the areas adjacent to the development footprint (just outside the FMZs), but have been planned and compensated through a system of fire protection described throughout this FPP.

#### **3.2.3 Climate**

Throughout Southern California and specifically at the Alternative H site, climate has a large influence on the fire risk. The Alternative H site climate is typical of a Mediterranean area, with warm, dry summers and wet winters. Precipitation typically occurs between December and March. The prevailing wind is an on-shore flow with fall Santa Ana winds from the northeast that may gust to 50 miles per hour (mph) or higher. Drying vegetation (fuel moisture of less than 5% for 1-hour fuels is possible) during the summer months becomes fuel available to advancing flames should an ignition occur. Extreme conditions, used in fire modeling for this site, include 92°F temperatures in summer and winds of up to 50 mph during the fall. Relative humidity of 12% or less is possible during fire season.

#### **3.2.4 Fire History**

Fire history is an important component of an FPP. Fire history information can provide an understanding of fire frequency, fire type, most vulnerable Alternative H areas, and significant ignition sources, amongst others. Fire history represented in this FPP utilizes the Fire and Resource Assessment Program (FRAP) database. FRAP summarizes fire perimeter data dating to the late 1800's, but which is incomplete due to the fact that it includes only fires over 10 acres in size and has incomplete perimeter data, especially for the first half of the 20<sup>th</sup> century (Syphard and Keeley 2016). However, the data does provide a summary of recorded fires and can be used to show whether large fires have occurred in the Alternative H area, which indicates whether they may be possible in the future.

Within five miles of Alternative H, there have been 90 fires recorded by CAL FIRE since 1910 (FRAP 2016). A total of 13 fires, ranging from 63 acres (un-named 1969 fire) to 90,440 acres (Harris Fire) are noted to have burned through the Alternative H site dating back to 1910. Recorded fires since 1910 that have burned onto the site are listed in Table 1. The most notable fire (Harris fire) occurred during October 2007, and burned large areas of the southwestern portion of San Diego County, including a large portion of the Alternative H area. Appendix B of this FPP, – the

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Otay Ranch Resort Village – Alternative H Vicinity Fire History Exhibit, presents a graphical view of the Alternative H area’s recorded fire history.

**Table 1**  
**Otay Ranch Resort Village – Alternative H Fire History**  
**(Wildfires that Burned onto the Site )**

Fire Year <sup>1</sup>	Fire Name	Total Area Burned (acres)
1910	Un-named	1,989
1911	Un-named	10,394
1968	Proctor	2,385
1969	Un-named	63
1978	Un-named	270
1979	Un-named	146
1980	Otay #21	133
1980	Otay #6	3,314
1980	Proctor	2,300
1986	Daley #3	347
1989	Proctor #7	486
2003	Mine/Otay	44,734
2007	Harris	90,440

**Notes:**

Based on polygon GIS data from CALFIRE’s Fire and Resource Assessment Program (FRAP), which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2016.



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#### **4 DETERMINATION OF ALTERNATIVE H EFFECTS**

A Fire Protection Plan provides an evaluation of the adverse environmental effects a project may have from wildland fire. The FPP must identify mitigation for identified impacts to ensure development does not unnecessarily expose people or structures to a significant loss, injury or death involving wildland fires. Significance is determined by answering the following guidelines:

***Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildland are adjacent to urbanized areas or where residences are intermixed with wildland?***

The wildland fire risk in the vicinity of the Alternative H Area has been analyzed according to San Diego County Guidelines for Determining Significance – Wildland Fire and Fire Protection (County of San Diego 2010). It has been determined that wildfires may occur in wildland areas that surround the Alternative H Area, but would not be significantly increased in frequency, duration, or size with the construction of the proposed Alternative H. Alternative H would include conversion of fuels to maintained development with designated SDCFA review of landscaping, FMZs, and highly ignition resistant structures; a funded entity to manage and maintain the FMZ zones 1 and 2; and, third-party annual FMZ inspections to confirm the FMZ areas are maintained as designed and, therefore, would function as intended. As such, the Development Footprint will be largely converted from readily ignited fuels to ignition resistant landscape and structures that are provided defensible space consistent with State of California and County of San Diego standards, access for firefighters and early evacuations, water and fire flow to code, and other fire protection features, as described throughout this FPP.

#### **Ignition Resistant Structures**

The ignition resistant requirements for new communities built in high or very high fire hazard severity zones have been determined by State and Local Fire agencies to provide acceptable resistance to ignition from the types of wildland fires produced by the County's wildland fuels, terrain, and weather. San Diego County conducted after-fire assessments that strongly indicate that the building codes are working in preventing home loss. Of the 15,000 structures within the 2003 Cedar fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 Witch Creek Fire perimeter, 17% were damaged or destroyed. Only 3% of the 789 homes that were built to 2001 codes were impacted and only 2% of the 1,218 structures built to the 2004 Codes were impacted (IBHS 2008). Many of the newer structures that were lost were due to human error. Similarly, of 194 structures lost or damaged in the Orange County Freeway Complex Fire (2008), there were no structures within the fire perimeter lost that were built to at least the 1996

## **Fire Protection Plan**

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special fire area codes (similar to the CBC Chapter 7-A requirements) enacted by the City of Yorba Linda (Orange County Fire Authority 2008). Those codes required structure hardening against wildfire, but are less restrictive and result in less ignition resistant structures than current San Diego County Building and Fire Code requirements. Structures built to the 2016 Fire and Building Codes result in highly ignition and ember resistant structures. When combined with maintained FMZs, fire apparatus access, water (fire flow), and an equipped and trained responding fire agency, the result is a defensible development.

#### **Effective Fuel Modification Zones**

Provisions for modified fuel areas separating wildland fuels from structures have also reduced the number of fuel-related structure losses by providing separation between structures and heat generated by wildland fuels. As such, most of the primary components of the layered fire protection system provided for Alternative H are required by SDCFA. However, they are worth listing because they have been proven effective for minimizing structural vulnerability to wildfire. In addition, interior fire sprinklers, which will be provided in all structures (now required by code), have a track record of extremely high reliability (Bukowski et al. no date) approaching 98% and statistics indicate that fires in homes with sprinklers resulted in 82% lower property damage and 68% lower loss of life (Hall 2013). Although not designed for wildland fire defense, should embers succeed in entering a structure, sprinklers provide an additional layer of life safety and structure protection.

Even though these measures are now required by the latest Building and Fire Codes, at one time, they were used as mitigation measures for buildings in wildland urban interface areas, because they were known to reduce structure vulnerability to wildfire. These measures performed so well, they were adopted into the 2007 California Building Code and have been retained and enhanced in code updates since then. The following proposed Alternative H features are required for new development in WUI areas, and will form the basis of the system to provide adequate access by emergency responders and provide the protection necessary to minimize structural ignitions:

- Application of the latest adopted ignition resistant building codes;
- Exterior wall coverings are to be non-combustible or ignition resistant;
- Multi-pane glazing with a minimum of one tempered pane;
- Ember-resistant vents (recommend BrandGuard, O'Hagin, or similar vents);
- Interior, automatic fire sprinklers to code for occupancy type;
- Modern infrastructure, access roads, and water delivery system;
- Maintained FMZs; and

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- Fire apparatus access roads throughout the Alternative H Area's developed areas.

#### **Ignition Sources**

The types of potential ignition sources that currently exist in the area include overhead power lines, vehicles, roadways, and neighboring residential neighborhoods. Alternative H would introduce potential ignition sources, particularly more people in the area. However, mitigating this increase in potential ignition sources, the proposed Alternative H would convert more than 102 acres of ignitable fuels to lower flammability landscape (parks and HOA common areas) and include better access throughout the Development Footprint, managed and maintained landscapes, and consistent human presence in the area, which will reduce the likelihood of arson, off-road vehicles, or shooting related fires. In addition, Alternative H will include a new fire station, apparatus and staffing that will be able to respond quickly to reported fires.

The FMZs are designed to not only minimize wildfire encroaching upon the community, but to minimize the likelihood that an ignition from the development area spreads into the MSCP Preserve by separating the unmaintained vegetation occurring outside the FMZs with that in the FMZs. Vegetation within the FMZs will be maintained and the first 70 feet irrigated, resulting in high fuel moisture, which is more difficult to ignite (USFS 2015); reduced fuel densities; lack of fuel continuity; and a reduction in the receptiveness of the landscape to ignition and fire spread. Fires from off site would not have continuous fuels across the Development Footprint and would, therefore, be expected to burn around and/or over the developed landscape via spotting. Burning vegetation embers may land on Alternative H structures, but are not likely to result in ignition based on ember decay rates and the types of non-combustible and ignition resistant materials and venting that will be used within Alternative H and the ongoing inspections and maintenance that will occur in Alternative H's landscaped areas and FMZs.

Alternative H would comply with the applicable fire and building codes and would include a layered fire protection system designed to current codes and inclusive of Alternative H Area-specific measures that will result in an Alternative H that is less susceptible to wildfire than surrounding landscapes and that would facilitate firefighter and medical aid response. These features combined with the ignition resistance construction required result in consistency with San Diego County Guidelines and a resulting acceptable fire hazard risk.

#### ***Would the project result in inadequate emergency access?***

Alternative H would not result in inadequate emergency access. The proposed internal looped roadways meet County standards and provide emergency access over the roadways that include a minimum of 24 feet (two 12-foot-wide, unobstructed travel lanes) and additional width for parking.

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Additionally, the roads would provide residents the option to evacuate from at least two egress access points in two different directions from each neighborhood. Depending on the nature of the emergency, residents can exit to the west or east on Otay Lakes Road. In emergencies where it is safer to remain within the developed portions of Alternative H Area, temporary refuge within the Project's structures and Village Center would be possible as a contingency, if evacuation was considered unsafe, given the large area of developed landscape that will result from Alternative H's construction. The internal roadways from the residences to Otay Lakes Road will be provided fuel modified passageways. Portions of Otay Lakes Road to the east towards SR 94 of the Alternative H's developed areas would traverse through areas with natural vegetation (consistent with current fuels). Alternative H will provide a minimum of 20 feet of modified fuel areas along both sides of the road within the Alternative H site boundaries to provide a buffer that will act to reduce ignitions from vehicle related causes and provide set back from wildland fuels.

Evacuation would be focused on early evacuations, if sufficient time allows, following the "Ready, Set, Go!" model, or else contingency options that would be available to Alternative H may be determined to be safer than evacuating by responding fire and law enforcement personnel. Evacuation information (including this Evacuation Plan) will be prepared for Alternative H and provided to the residents so that all residents are aware of the evacuation routes, of the fluidity of wildfire events, and of the options that may be presented to them by responding law enforcement and/or fire personnel, Reverse 911, or other officials. An annual evacuation awareness program will be conducted, and online access to fire awareness educational material will be provided on the community's Website.

***Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance service ratios, response times or other performance objectives for fire protection?***

Alternative H is projected by call volume analysis (using San Diego County per-capita call generation factor of 82 calls per 1,000 persons) to add approximately 642 calls per year to the SDCFA's existing call load. This call volume (1.8 calls per day) is not considered enough of an increase to require additional resources. However, to meet the County's General Plan 5 emergency minute travel time standard, Alternative H will require the provision of a new fire station within the Alternative H Area. With the new fire station, SDCFA has indicated it can serve the development (Appendix C). This new fire station would be a residential fire station with two engine bays meeting SDCFA's current configuration standards for this type of facility and Alternative H would provide a fire engine (Type I or II) to SDCFA's specifications. Staffing would include two career firefighter positions and one

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reserve until a threshold is reached where a third career position can be financed and the reserve firefighter position would continue for a 4.0 staffing.

Interim fire protection during construction may be provided by Chula Vista Fire Department Station 8 or a temporary SDCFA Fire Station. Once built, primary response (first-in) would be provided by the Alternative H fire station. That station would be able to provide first engine response to 100% of Alternative H's lots within the most restrictive standard of 5 minutes of travel, consistent with the San Diego County General Plan Safety Element for village and limited semi-rural residential areas. The next closest SDCFA station is Station 36, located at 14024 Peaceful Valley Ranch Road, approximately 9.7 miles from the eastern entrance of Alternative H along Otay Lakes Road. Station 36 is beyond the five minute travel time response. Chula Vista Fire Station #8 is the next closest station. Station #8 is capable of reaching roughly 49% of the proposed Alternative H's lots within 5-minute travel time and all residential lots within 10 minutes. Alternative H will provide funding for constructing, equipping, operating and maintaining the new fire station. The station will be part of the proposed public safety facility, which is located in the central portion of the development.

***Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?***

Alternative H will be served by Otay Water District and sufficient water supplies will be available to serve the proposed development from existing entitlements and resources. SDCFA, and the Otay Water District require new development to meet a minimum 2,500 gallons per minute (gpm) fire flow. A 950 (elevation zone) water tank to the north of the Otay Ranch Resort Village is planned. The Otay Water District will provide a water availability/will serve form to Alternative H development (Appendix D).

The measures described in the responses to these significance questions are provided in more detail in the following sections.

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### 5 ANTICIPATED FIRE BEHAVIOR

#### 5.1 Fire Behavior Modeling

Fire behavior modeling includes analysis of site-specific information resulting in modeled representations of how wildfire would move through available fuels within the Alternative H area. Fire behavior calculations are based on site-specific fuel characteristics which correlate to fire science research analyzing heat transfer related to specific fire behavior. To objectively predict flame lengths and intensities, the BehavePlus 3.0.1 fire behavior fuel modeling system (Andrews, Bevins, and Seli 2004) was applied using predominant fuel characteristics, slope percentages, and three representative fuel models (Scott and Burgan 2005, Weise and Regelbrugge. 1997) observed on site. Also, FlamMap (Finney 2004), a Geographical Information System (GIS) based fire behavior software application which provides a useful graphical display of the modeling output, was prepared by Dudek for Alternative H to graphically portray the fire behavior pre- and post- treatment.

Recent field data collection efforts and past fire behavior modeling results from the Otay Ranch Resort Village FPP (September 2014) was used by Dudek for updating GIS exhibits for the Otay Ranch Village - Alternative H Project. Fire modeling results are provided below and a more detailed presentation of the BehavePlus modeling analysis, including fuel moisture and weather input variables, is provided in Appendix E.

##### 5.1.1 BehavePlus Fire Behavior Modeling Effort

The results from the BehavePlus fire behavior model are presented in Table 2. As presented, wildfire behavior for areas represented by a fuel model SH7 varies based on timing of fire. A worst-case summer fire would result in a fire spreading at a rate of up to 1.1 mph with flame lengths of 21 feet. During a typical fall fire with gusty Santa Ana winds and low fuel moisture, fire is expected to be moderately fast moving at up to 2.3 mph with highest flame length values reaching approximately 31 feet. Spotting is projected to occur up to approximately 0.6 mile during a summer fire and over 1 mile during a typical fall fire.

**Table 2**  
**BehavePlus Fire Behavior Modeling Results**

Fuel Model	BehavePlus Output	Summer Fire	Fall Fire	Extreme Fall Fire
GS2	Surface Rate of Spread	0.7 mph	1.2 mph	—
	Flame Length	8.0 feet	11.0 feet	15.0 feet
	Spot Distance from Wind Driven Surface Fire	0.4 miles	0.6 miles	—
	Ignition Probability	89%	100%	—

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**Table 2**  
**BehavePlus Fire Behavior Modeling Results**

Fuel Model	BehavePlus Output	Summer Fire	Fall Fire	Extreme Fall Fire
SCAL15	Surface Rate of Spread	0.6 mph	1.1 mph	—
	Flame Length	14.0 feet	18.0 feet	20.0 feet
	Spot Distance from Wind Driven Surface Fire	0.6 miles	0.8 miles	—
	Ignition Probability	89%	100%	—
SH7	Surface Rate of Spread	1.1 mph	2.3 mph	—
	Flame Length	21 feet	31 feet	46.0 feet
	Spot Distance from Wind Driven Surface fire	0.6 miles	1.1 miles	2.5 miles
	Ignition Probability	89%	100%	—

To replicate a catastrophic wildfire scenario, 50 mph winds were introduced for the fall/winter model scenario. The resulting extreme weather flame lengths are projected to be 46 feet with maximum spotting distance reaching 2.5 miles. Based on this result, 100-foot vegetation management zones are recommended for exposed portions of the Alternative H perimeter and planting restrictions will be in place for all Alternative H landscapes.

Wildfire behavior in chamise (SCAL15) also varies based on timing of fire. A worst-case summer fire would result in a fire spreading at a rate of up to 0.6 mph with flame lengths of up to 14 feet. During a typical fall fire with gusty Santa Ana winds and low fuel moisture, fire is expected to be moderately fast moving at up to 1.1 mph with highest flame length values reaching approximately 18 feet. Under extreme fall conditions, flame lengths were modeled at 20 feet. Spotting distances are projected to be roughly 0.6 mile during a summer fire and 1.1 miles for a fall fire.

These modeling results were used to support analysis and calculation of the size and composition of recommended vegetation management zones. Vegetation management zones, in which flammable vegetation, continuous fuel beds, and ornamental shrubbery are removed, reduce the intensity of approaching fire and help reduce the likelihood of a structural fire spreading into naturally vegetated areas.

It should be noted that the results presented in Table 1 depict values based on inputs to the BehavePlus software. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. Model results are used as a basis for planning with an understanding that actual fire behavior for a given location will be affected by many factors, including unpredictable weather patterns, small-scale topographic variations, or changing vegetation patterns.



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### **5.1.2 FlamMap Analysis**

Dudek utilized FlamMap software to verify and graphically depict fire modeling results for the Alternative H site. Both pre- and post-treatment conditions were evaluated, incorporating both summer weather conditions (20 mph winds from the south-west) and more extreme fall weather conditions (50 mph winds from the north-east). To maintain consistency with BehavePlus fire modeling efforts conducted for the site, the same weather and fuel input variables were incorporated into the FlamMap modeling runs. The only exception occurred in the modeling of post-treatment conditions. In this case, a custom fuel model (Fuel Model 20) was used to represent the anticipated irrigated landscape condition present in the fuel modification areas. Areas within the Alternative H site that existed beyond the limits of fuel modification areas, but within proposed grading limits were modeled using a Fuel Model 2 to depict their developed conditions.

The custom Fuel Model 20 was created by Morais<sup>1</sup> and attempts to mimic the irrigated, exotic landscape commonly found in the wildland-urban interface in southern California. This model utilizes variables from standard models 1 and 7. For Alternative H, two variations of the model were used in modeling the fuel modification areas. Specifically, fuel bed depth values were altered by zone, leaving all other fuel model variables constant. Depth values were based on recommended fuel modification area requirements (4-inch height for Zone A, 6-inch height for Zone B). Areas modeled as a Fuel Model 2 in the post-treatment analysis were assigned this model value based on Dudek's evaluation of the proposed hydroseed mix to be used in re-vegetating manufactured slopes. The hydroseed mix consists primarily of grass species, with lesser quantities of native shrubs commonly associated with CSS habitat types, resulting in a lower fuel landscape.

## **5.2 Fire Behavior Summary**

### **5.2.1 Existing Condition**

Appendices F and G graphically represent the FlamMap fire behavior modeling outputs for existing fuels conditions. As mentioned, the model inputs derived for the BehavePlus modeling were duplicated by Dudek in the FlamMap application, with nearly identical results. As FlamMap utilizes site-specific digital terrain data (including slope, aspect, and elevation data) slight variations in predicted flame length values can be observed based on fluctuations in topography. Such variations are not observable in BehavePlus modeling runs using constant slope variables. As presented, wildfire behavior in each of the fuel types varies based on differing weather condition inputs.

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<sup>1</sup> Morais, M. UCSB Custom Model. [http://www.physics.ucsb.edu/~complex/research/hfire/fuels/ucsb\\_20\\_desc.html](http://www.physics.ucsb.edu/~complex/research/hfire/fuels/ucsb_20_desc.html)

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#### **5.2.2 Post-development Condition**

As expected and illustrated in Appendices F and G, the anticipated flame length values in untreated, preserve open space areas are higher than those in the fuel modification areas following treatment as directed in this FPP. In fact, significant reductions in flame lengths are anticipated through the use of fuel modification zones. Based on an evaluation of FlamMap modeling outputs, the 46-foot flame lengths predicted during pre-treatment modeling of extreme weather scenarios are significantly reduced to less than 10 feet at the outer edges of the fuel modification areas and to less than 5 feet by the time the inner portions of the fuel modification areas are reached. Similar reductions are observed during less extreme summer weather conditions.

The benefit provided by fuel modification zones is a reduction in the fire intensity and radiant and convective heat to which a structure would otherwise be exposed. This significant reduction in fire intensity does not mitigate the effect of flying embers, which may travel a mile or more during wind driven fires. However, the structures will be built using the latest building and fire codes which have specifically been enacted to reduce the potential for flame and ember penetration, leading causes for structural losses during wildfires.

#### **5.3 Alternative H Area Fire Assessment**

Given the climatic, vegetation, WUI location, and topography characteristics along with the fire history and fire behavior modeling results previously discussed in this FPP, the Alternative H site is considered vulnerable to wildfire starting in, burning onto, or spotting onto the site. This is especially the case due to the large amount of naturally vegetated, unmaintained open space that will be preserved adjacent the site. Under worst-case fall weather conditions, there is potential for fire to move rapidly through the Alternative H site's fuel types. The most common type of fire anticipated in the vicinity of the Alternative H area is a wind-driven brush fire from the north, northeast during the fall with flame lengths reaching nearly 50 feet. The rate of spread would be rapid due to volatile fuels, wind, and low fuel moisture. A typical cause may be related to roadways (tossed cigarette, vehicle accidents, or vehicle fire), or agricultural tractor work, welding, burning, arson or fireworks discharged in the area.

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## **6 EMERGENCY RESPONSE AND SERVICE**

### **6.1 Existing Fire Department Response Capabilities**

Alternative H is located within the SDCFA responsibility area. The SDCFA has identified strategic response resource positioning at the proposed Alternative H's fire station that will provide efficient coverage for the Alternative H development.

The City of Chula Vista provides fire service to areas west/southwest of the Alternative H Area and has a fire station located approximately 1.6 miles from the Alternative H Area. Chula Vista Fire Department (CVFD) has not been considered for providing fire protection services for Alternative H for two primary reasons: (1) the Alternative H Area is within SDCFA jurisdictional area, an agency that has indicated it can and will serve the Alternative H; and (2) there are no existing or planned Chula Vista Fire Stations that can meet the County's 5-minute General Plan travel time standard for the eastern portion of Alternative H using standard modeling inputs.

The addition of SDCFA emergency response resources within Alternative H will provide enhanced coverage to this portion of the SDCFA response area and is considered to also benefit the City of Chula Vista Fire Department in its eastern City areas based on existing automatic aid agreements.

Based on current resources, there are up to two staffed fire stations with three fire agencies (CALFIRE, SDCFA, and Chula Vista) in the area. The SDCFA is a combination fire agency that uses both paid and reserve firefighters. Initial response to Alternative H would be from Station 36. Interim response timing threshold would be determined in a fire service agreement between Alternative H and SDCFA and would be in place prior to the proposed Alternative H's Board of Supervisor's hearing. Station 36 at 14024 Peaceful Valley Road in Jamul, is approximately 9.6 road miles from Alternative H's eastern entrances. Station 36 has seven full-time firefighters and the following apparatus:

- 1 structural fire engine
- 1 ladder truck
- 1 Battalion Chief
- 1 rescue squad truck
- 1 paramedic Ambulance
- 1 light and air unit

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Fire Station 36 currently responds to approximately 1 call per day (2012 statistics). Because Station 36 cannot meet the General Plan's 5-minute travel time standard to those portions of Alternative H where it applies, the proposed Alternative H will be required and has agreed to build a station within the Alternative H Area's development area.

Vegetation fires require special apparatus and depending on weather and fuel conditions, may require a significant response. SDCFA will be able to call on Alternative H Station resources and the full CAL FIRE response weight.

Proposed Otay Ranch Resort Village Station:

- Type 1 or Type II engine

Full CAL FIRE response:

- Five to 10 Type III engines (depending on dispatch level)
- Battalion Chief
- Three fixed-wing aircraft (two tankers and air attack)
- Dozer
- Two hand crews
- Two helicopters

Although out of the direct protection area, the neighboring fire agency, City of Chula Vista Fire Department, includes resources that may be available to respond to emergency calls as second or third engine via the existing or an updated automatic or mutual aid agreement. It is anticipated that the Alternative H's fire station would respond into Chula Vista at least as often as Chula Vista Fire responded to Alternative H under the same agreement. Of the existing fire stations in the vicinity of the proposed Alternative H, Chula Vista's Fire Station 8 is the closest. Chula Vista Fire Station 8 is located at the intersection of Otay Lakes Road and Woods Drive, approximately 1.6 miles from the western-most entrance to the Alternative H Area. It houses a staffed engine company. This location does allow a 5-minute travel time to the majority of the proposed Alternative H. The closest ladder truck is housed at Chula Vista Fire Station No. 7 on La Media Drive and Santa Venetia, approximately 6.0 road miles west of Alternative H's developed areas.

The SDCFA has recently identified strategic response resource repositioning that will provide more efficient and better coverage for the western portion of their service area that abuts the City of Chula Vista's eastern boundaries. This re-positioning and addition of response resources will also benefit Chula Vista based on the existing automatic aid agreement.

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It is anticipated that Alternative H would provide a fire station and an Alternative H provided ALS, Schedule A engine company. The station would be equipped with a Type I fire engine. An additional Type II (or equivalent Type III) will be relocated to the proposed Alternative H fire station along with its Schedule B 3 man crew. Further enhancing the emergency medical response, changes in the private ambulance configuration will provide for an ALS ambulance located at the Otay Ranch Resort Village Fire Station.

## **6.2 Estimated Calls and Demand for Service from the Alternative H**

As indicated in Table 3, using San Diego County fire agencies' estimate of 82 annual calls per 1,000 population, which is consistent with nearby City of Chula Vista call data (80 annual calls per 1,000 population, as calculated from City provided data), the Alternative H's estimated 6,977 permanent residents (population estimates based on 3.6 persons per estimated dwelling unit for all occupancy types) and estimated 400 hotel guests (2 persons per room at 100% occupancy), and 450 on-site staff associated with the school, the resort, and the mixed use sites, would generate approximately 642 calls per year (about 1.8 calls per day), 85% of which (1.5 calls per day) are expected to be medical emergencies and 2.5% (0.3 calls per day) fire related calls, based on past call statistics in nearby Chula Vista.

**Table 3**  
**Calculated Call Volume Associated with the Otay Ranch Resort Village Alternative H**

<b>Emergency Calls per 1,000 (County Data)</b>	<b>Number of Residents, Guests, and Staff</b>	<b>Avg. No. Calls per Year (7,827/1,000)x82</b>	<b>Avg. No. Calls per Day (642/365)</b>
82	7,827 (estimate)	642	1.8

**Notes:**

1. Total anticipated calls apply San Diego County average call volumes (2012) and are conservative in that they incorporate calls from high call volume land uses as well as lower call volume land uses, like new planned communities.

## **6.3 Fire Response Modeling**

The San Diego County General Plan Safety Element includes Travel Time Standards from the "Closest Fire Station" (County of San Diego 2011). Travel time does not represent total response time, which is calculated by adding the travel time to the call processing time and to the turnout/reflex time. Generally, the call processing and turnout/reflex time would add between two to three minutes to the travel time. Table 4 establishes a service level standard, not a requirement, for fire and first responder emergency medical services that is appropriate to the area where a development is located. Standards are intended to (1) help ensure development occurs in areas with adequate fire protection and/or (2) help improve fire service in areas with inadequate coverage by requiring mitigation for service-level improvements as part of Alternative H's approval.

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**Table 4**  
**Time Response Standards from the Closest Fire Station\***

Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> <li>Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-1)</li> <li>Commercial and Industrial Designations in the Village Regional Category</li> <li>Development located within a Village Boundary</li> </ul>	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	<ul style="list-style-type: none"> <li>Semi-Rural Residential Areas (&gt; SR-1 and SR-2 and SR-4)</li> <li>Commercial and Industrial Designations in the Semi-Rural Regional Category</li> <li>Development located within a Rural Village Boundary</li> </ul>	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	Limited Semi-Rural Residential areas (>SR-4, SR-10) and Rural Lands (RL-20) All Commercial and Industrial Designations in the Rural Lands Regional Category	In general, this travel time is appropriate for very low density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.
>20 min	Very-low rural land densities (RL-40 and RL-80)	Application of very-low rural densities mitigates the risk associated with wildfires by drastically reducing the number of people potentially exposed to this hazard. Future subdivisions at these densities are not required to meet a travel time standard. However, independent fire districts should impose additional mitigation requirements on development in these areas.

**Source:** San Diego County General Plan, Safety Element, Table S-1

\* The most restrictive standard will apply when the density, regional category and/or village/rural village boundary do not yield a consistent response time standard.

\*\* Travel time standards do not guarantee a specific level of service or response time from fire and emergency services. Level of service is determined by the funding and resources available to the responding entity.

The Alternative H Area would be subject to the San Diego County General Plan 5-minute travel time standard post development based on its parcel sizes and proposed Alternative H densities and applying the most restrictive travel time.

In an effort to understand fire department response capabilities, Dudek conducted an analysis of the travel-time response coverage from the closest, existing station (CVFD Station 8) and from the proposed Alternative H public safety site (fire station). The closest existing SDCFA station (Fire Station #36) is beyond the five minute travel time response<sup>2</sup>. This modeling analysis was conducted using Network Analyst tools within GIS software, road data files, and Alternative H development plan data. Response travel speed for this analysis was held constant at 35 mph, consistent with the Insurance

<sup>2</sup> SDCFA Fire Station No. 36 is approximately 17 minutes travel time response to the project site. Consequently, Station 36 was not included in the travel time response modeling effort.

## Fire Protection Plan

### The Otay Ranch Resort Village - Alternative H Project

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Services Office Public Protection Classification Program's Response Time Standard, and incorporated impedances (slowdowns) for intersections and turns by the model. This average speed has been validated for the Insurance Services Office as still being applicable as a predictive tool and considers average terrain, average traffic, weather, and slowing down for intersections. Alternative H circulation systems include certain traffic-calming tools to improve pedestrian safety, and a 35 mph response travel speed is considered appropriate because the Villages' street sections comply with fire access travel width requirements. Model output files were used to analyze the quantity and percentage of individual proposed Alternative H units that could be reached by fire response personnel from each station, assuming travel time and speed constraints.

Once the network data set parameters were finalized, Dudek ran network models to depict the response coverage from CVFD Station No. 8 and the permanent public safety site location. The model results provided in Figures 6 and 7 depict the geographic limits that can be reached within travel time intervals. Table 5 presents tabular results of the emergency response analysis.

**Table 5**  
**Emergency Response Travel Times from**  
**Proposed On-site Public Safety Site and Chula Vista Fire Station 8**

<b>5 Minute Travel Time</b>	<b>Quantity of Units Reached within 5-minutes</b>	<b>Percentage of Residential Units Reached (%) within 5-minutes</b>	<b>Quantity of Units Reached within 10-minutes</b>	<b>Percentage of Residential Units Reached (%) within 10-minutes</b>
On-site Public Safety Site	1,938	100	1,938*	100
CVFD Station #8	940*	49	1,938*	100

CVFD = Chula Vista Fire Department

\* Includes multifamily residential (57 units)

The travel time analysis has considered the proposed traffic calming measures proposed for Alternative H. The types of traffic calming proposed maintain the emergency travel speeds modeled for this analysis.

As indicated in Table 5 and Figure 6, the closest existing CVFD station, Station 8 in City of Chula Vista, is capable of reaching roughly 49% of the proposed Alternative H's lots within the 5-minute travel time and all of the residential lots within 10 minutes. The proposed fire station as presented on Figure 7 and Table 5, can reach all of the proposed development lots within Alternative H within the most restrictive 5-minute travel time standard. Based on this information, Alternative H meets the County's travel time standard once the permanent fire station is built on the public safety site.

### **Response Capability Impact Assessment and Mitigation**

Alternative H includes a significant number of new homes, a school, and commercial structures. Service level requirements could, in the absence of fire facilities and resources improvements,

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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cause a decline in the SDCFA response times and capabilities. The requirements described in this FPP are intended to aid fire-fighting personnel and minimize the demand placed on the existing emergency service system. However, additional firefighting capabilities and resources will be required to meet the demands created by Alternative H.

To avoid potential degradation of services, meet the anticipated increased demand in accordance with County emergency travel times, and respond to the on-site risks, including the resort, Alternative H will be required to provide additional firefighting capabilities. General additional resources required to serve the Alternative H are outlined in Section 6.4 of this FPP.

#### **6.4 Alternative H Fire and Emergency Services**

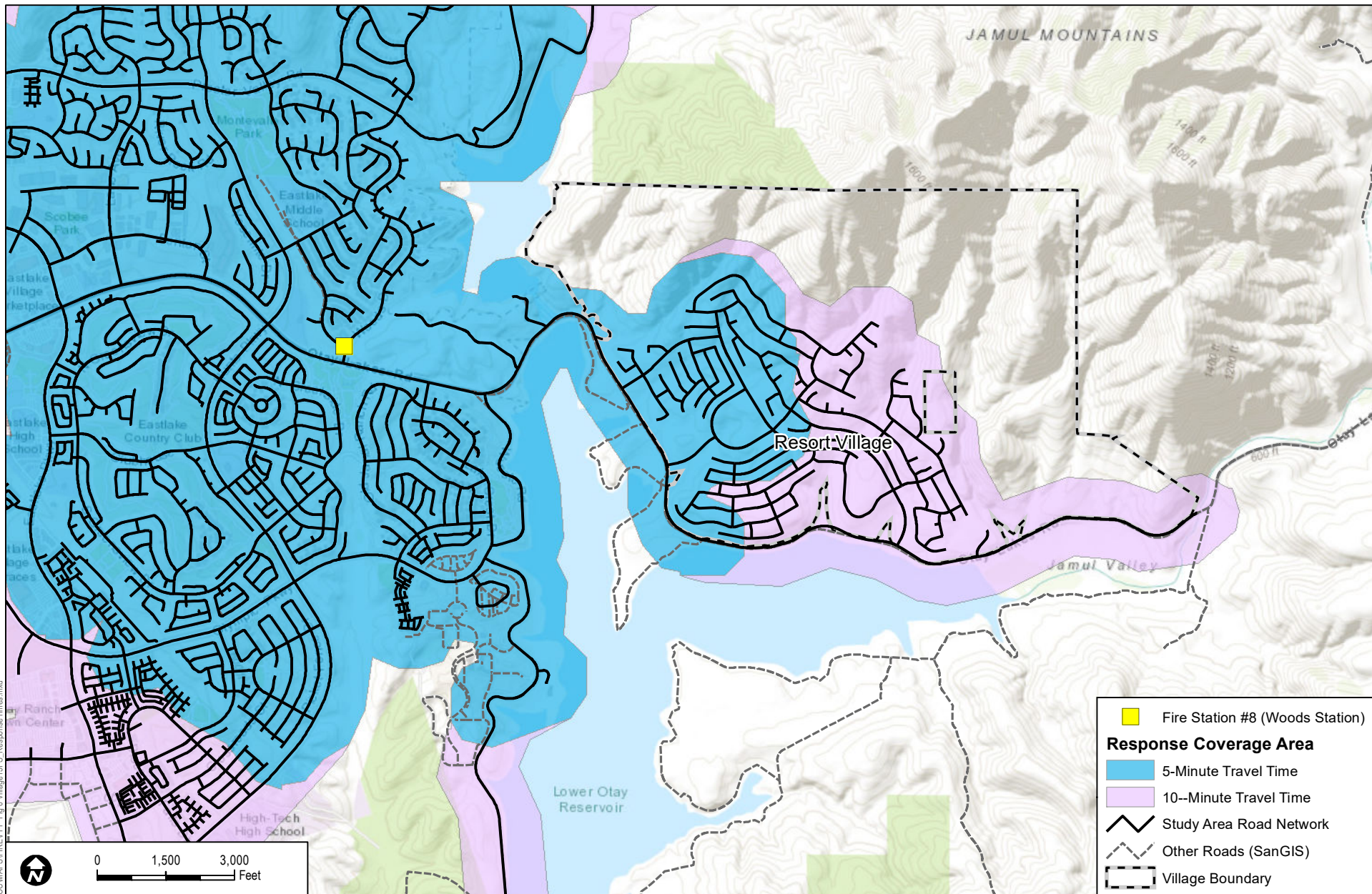
The following summary provides information pertaining to fire and emergency service response configuration for the Village under Alternative H. Final fire and emergency services may include implementation of an optional configuration, as discussed below.

##### **Alternative H Fire and Emergency Response Configuration**

As discussed, the Otay Ranch Resort Village Alternative H is subject to the 5-minute travel time standard. To ensure that all lots within Alternative H's Development Footprint could be served within a 5-minute travel time, the public safety site would be centrally located within the Village Core. Not only does this provide for better response coverage, but the location adjacent to the neighborhood Village Green park, and across from the mixed-use and elementary school site ensure the public safety site would also be a civic presence and located near the highest anticipated potential call-generating land uses. Timing of construction of a temporary station (if the permanent station is not constructed at the commencement of construction) and a permanent fire station within Alternative H would be finalized and documented in a Fire Services Agreement between the Alternative H applicant and the SDCFA. The temporary fire station, if necessary, would be available and located with SDCFA guidance so that it is available during vertical construction and for a specified period. Construction of the permanent fire station would be on the public safety site identified in the Otay Ranch Resort Village Alternative H Specific Plan and Tentative Map at an agreed upon trigger threshold, that would be detailed in the Fire Services Agreement.

Alternative H would provide fair share funding toward staffing and equipping the station of a size that would be needed to serve the proposed Alternative H's generated calls. The type and size of the permanent fire station would be based on the projected call volume and the anticipated apparatus and staffing. The fire station would include a proposed Alternative H-provided advanced life support Schedule A engine company. A Fire Service Agreement with final station size, engine type, and staffing would be drafted and ready to execute by the Alternative H applicant and the SDCFA prior to the proposed Alternative H's Board of Supervisor's hearing.





**FIGURE 6**

## Fire Department Travel Time Analysis - Chula Vista FD Fire Station #8

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

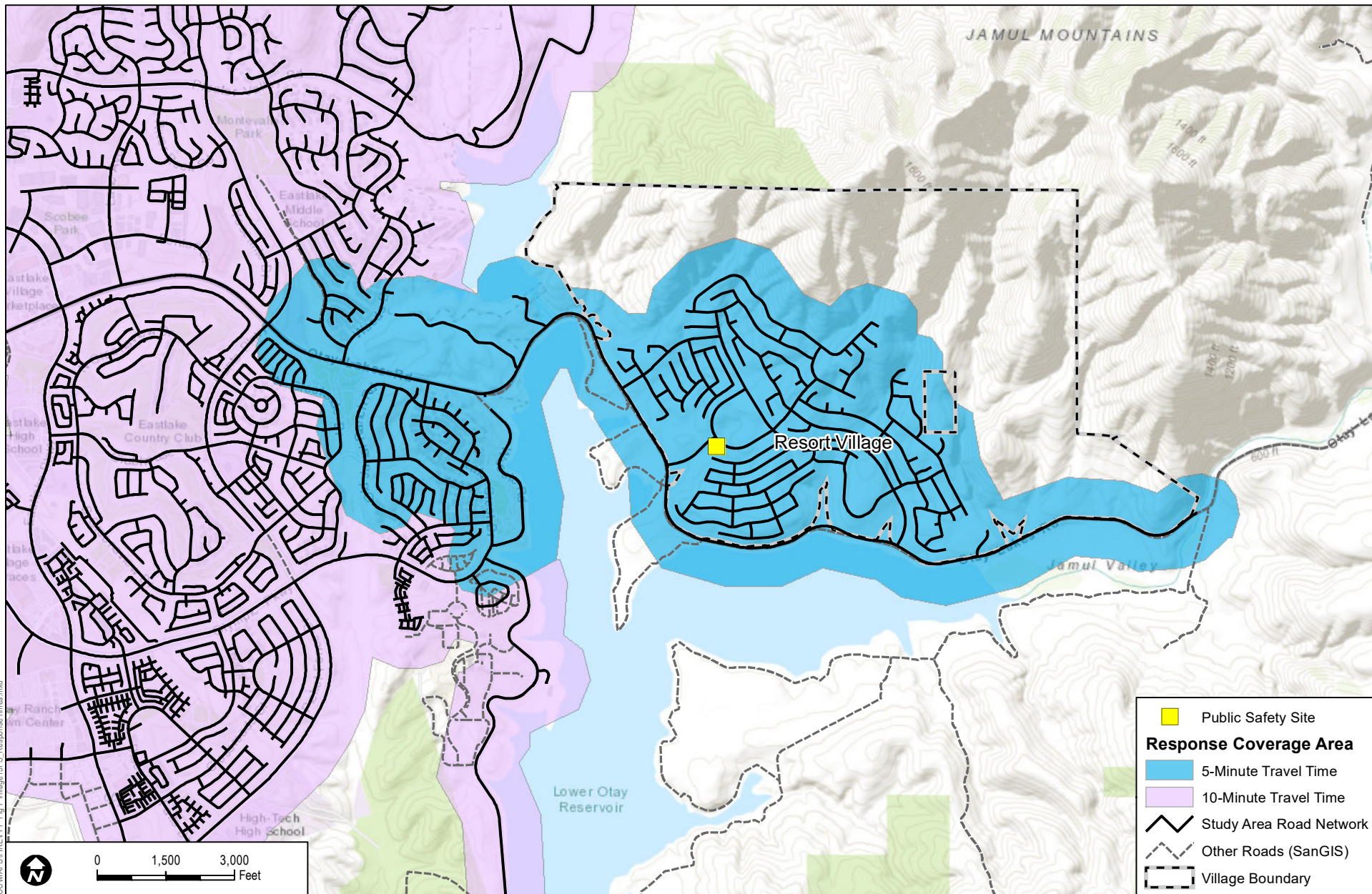
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**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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SOURCE: ESRI 2014, SanGIS 2013, Hunsaker 2018, Hale Engineering 2012

**DUDEK**

## Fire Department Travel Time Analysis - Proposed Fire Station

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

**FIGURE 7**

**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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### **7 FIRE SAFETY REQUIREMENTS- DEFENSIBLE SPACE, INFRASTRUCTURE, AND BUILDING IGNITION RESISTANCE**

#### **7.1 Fuel Modification Zones**

##### **7.1.1 Zones and Permitted Vegetation**

As indicated in preceding sections of this FPP, an important component of a fire protection system is the fuel modification area. Fuel modification areas are designed to gradually reduce fire intensity and flame lengths from advancing fire by strategically placing thinning zones, restricted vegetation zones, and irrigated zones adjacent to each other on the perimeter of the community's WUI exposed structures, as well as around all structures including:

- All residential and commercial occupancies
- School
- Resort
- Open space areas within the community
- Roads

Based on the modeled extreme weather flame lengths for Alternative H, flame lengths are projected to be approximately 46 feet high under extreme weather conditions. The fire behavior modeling system used to predict these flame lengths was not intended to determine sufficient fuel modification zone widths, but it does provide the average predicted length of the flames, which is a key element for determining “defensible space” distances for providing fire fighters with room to work and minimizing structure ignition. For Alternative H, the proposed fuel modification zone width is 120 feet, more than twice the modeled flame lengths in each of the fuel types represented on site.

A 100-foot wide HOA maintained FMZ is provided at the Alternative H perimeter along with an additional up to 20-foot wide, homeowner maintained rear and/or side yard FMZ on private lots. A minimum 120-foot FMZ is provided for all structures adjacent to the Thornmint Preserve in the southwest portion of the Alternative H Site Plan. Structures that back the Vernal Pool Preserve (OS Lot E) in the southeast corner of Alternative H do not include 100 feet of FMZ and will be protected by a 6 feet high block wall (See Section 8.0) and occurs within a vernal pool restoration area with less density of fuels as described below in Section 7.1.1.2.

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The following fuel modification zone requirements are proposed for Alternative H. These zones are presented graphically in Appendix H. In addition, a proposed Alternative H Plant List is provided in Appendix I.

#### **Fuel Modification Zone Definition:**

FMZs at Alternative H consist of a 20-foot wide fuel modification zone area in rear or side yard lots which will be maintained by the private lot owners. From the lot line out, a 100-foot-wide brush management area, extending outwards towards the Preserve, is provided, and will be maintained by the HOA's contractor.

#### **General Criteria in all FMZ areas:**

- All plant material listed on the Otay Ranch Village -Alternative H Fire Protection Plan Undesirable Plant List (Appendix J) will be prohibited within any brush management zone.
- No vegetation found on the Undesirable Plant List (Appendix J) shall be planted or remain in any Fuel Modification Zone.
- All plant material in irrigated zones shall be maintained in a succulent hydrated condition.
- Debris and trimmings produced by thinning and pruning shall be removed from the site, except for larger woody debris that may be chipped and left on site for weed and erosion control.
- There shall be no hedging of shrubs.
- Shrubs may be planted in clusters not exceeding a total of 400 square feet.
- A distance of no less than the width of the largest shrub's mature spread shall be provided between each shrub cluster.
- Non-shrub avenues devoid of shrubs shall be included to provide a clear access route from toe of slope to top of slope and shall be a minimum width of 6 feet and spaced a distance of 200 linear feet on center.
- Where shrubs or other plants are planted underneath trees, the tree canopy shall be maintained at a height no less than three times the shrub or other plant's mature height to break up any fire laddering<sup>3</sup> effect.
- Ground covers within the first five feet from structure restricted to non-flammable materials such as stone, rock, concrete, bare soil, or other. This provides protection for the

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<sup>3</sup> Ladder fuels are flammable plant material that can transmit fire burning in low-growing vegetation to taller vegetation. Examples of ladder fuels include low-lying tree branches and shrubs, climbing vines, and tree-form shrubs underneath the canopy of a large tree.

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weep screed area that has been shown to be a potential vulnerability for fire impingement from burning ground cover.

- Fencing within all lots that are directly adjacent open space or naturally vegetated areas would be constructed with non-combustible materials (stone, block, fire-rated wood, treated vinyl, etc.), or SDCFA-approved materials. In no case would the fence return (closest five feet of fencing to a structure) would be constructed of combustible materials.

#### **7.1.1.1 Zone A and A1 – Irrigated Zone (up to 70 feet wide)**

##### **Zone A – Definition:**

Zone A and A1 includes all public and private areas from a structure's furthest projection outward to 70 feet from the structure. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as defined in the landscape brush management exhibits. This irrigated zone would be planted with drought-tolerant, less flammable plant species from the proposed Alternative H Plant List (Appendix I).

- **General Criteria:** High-efficiency, automatic irrigation system to maintain hydrated plants without over-watering or attracting nuisance pests
- High-leaf-moisture plants as ground cover, less than 4 inches high. Shrubs are prohibited beneath tree crowns.
- No trees within 10 feet of structures (drip line of mature trees would be maintained 10 feet from structures).
- Tree spacing of a minimum 10 feet between canopies or as specified in Table 6 for steeper slopes

**Table 6**  
**Distance Between Tree Canopies by Percent Slope**

Percent of Slope	Required Distances Between Edge of Mature Tree Canopies (1)
0–20	10 feet
21–40	20 feet
41+	30 feet

<sup>1</sup> Determined from canopy dimensions as described in Sunset Western Garden Book (Current Edition)

<sup>2</sup> 2017 Consolidated Fire Code, Section 4907.3.1. Trees, County of San Diego.

- No tree limb encroachment within 10 feet of a chimney, including outside propane or natural gas barbecues or fireplaces

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- Tree maintenance includes limbing-up (canopy raising) 6 feet above ground or one-third the height of mature tree, whichever is greater;
- Maintenance including ongoing removal and/or thinning of undesirable combustible vegetation, replacement of dead/dying plantings, maintenance of the programming and functionality of the irrigation system, and regular trimming to prevent ladder fuels
- No combustible construction (structures) allowed in Zone A – HOA responsible for confirming that these conditions are met (would hire 3<sup>rd</sup> party inspector if desired by the SDCFA)
- Trees and tree form shrub species that naturally grow to heights that exceed 10 feet would be vertically pruned to prevent ladder fuels.
- Grasses would be cut to 4 inches in height. Native grasses can be cut after going to seed.

#### **7.1.1.2 Zone B – 50% Thinning Zone (50 feet wide):**

##### **Zone B – Definition:**

All public and private areas located between the outside edge of Zone A and up to 50 feet outward. These areas may be located on public slopes, private open-space lots, public streets, and/or private yards, as defined in the landscape brush management exhibits.

##### **General Criteria:**

- Represents a 50% thinning zone – 50% less fuel than on adjacent unmaintained preserve areas.  
*Exception: Within the Vernal Pool Open Space Area (OS Lot E), non-native grasses will be removed and the lot will be restored to a natural vernal pool watershed, resulting in bare areas intermixed with low native grasses and forbs. This vernal pool enhancement will occur throughout the OS Lot E.*
- All manufactured slopes within this area shall be serviced by a temporary, aboveground automatic irrigation system which will be turned off once the plantings are established, but will remain in place.
- Trees may be located within this zone, provided that they are planted in clusters of no more than three. A minimum distance of no less than 20 feet shall be maintained between the tree cluster's mature canopies. The trees will be limbed up to maintain vertical separation from understory shrubs.
- Only those trees on the County of San Diego's "Suggested Plant List for a Defensible Space" or the proposed Alternative H Plant List (Appendix I) and those approved by the biologist shall be allowed within this zone.



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- 75% of all groundcover and sprawling vine masses shall be limited to a maximum height of 36 inches.
- 25% of all groundcover and sprawling vine masses may reach a maximum height of 48 inches.
- Randomly placed approved succulent type plant material may exceed the height requirements, provided that they are spaced in groups of no more than three and a minimum of five feet away from described “clear access routes.”
- Single specimen native shrubs, exclusive of chamise and sage, may be retained, on 20-foot centers.

## **7.2 Other Vegetation Management**

### **7.2.1 Roadside Fuel Modification Zones**

Roadside FMZs would be provided and maintained for all Alternative H roads and designated fire department access roads. Roadside fuel modification zones would be 20 feet wide from edge of road on both sides of roadways adjacent natural open space areas.

*EXCEPTION occurs where the preserve is at the edge of an existing road, such as Otay Lakes Road where fuel modification may not be consistent with preserve management directives. However, in an effort to minimize the likelihood of road related activities triggering a Preserve wildfire, an HOA or CFD-funded maintenance district would provide ongoing maintenance for fuel management consistent with Code requirements and habitat management directives.*

Roadside FMZs would include the following restrictions and maintenance requirements:

- No use of Undesirable plants (Appendix J).
- Grass would be mowed to 4 inches.
- No dry grass within fuel modification zone.
- Single specimen trees, fire-resistive shrubs, or cultivated ground cover (such as green grass, succulents, or similar plants) may be used, provided they do not form a means of readily transmitting fire.

Trees may be planted within the Roadside FMZs. The following criteria must be followed:

- Tree spacing to be 20 feet between mature canopies (30 feet if adjacent to a slope steeper than 41%). This may require initial planting spacing of 50 feet on center.

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- Trees must be limbed up one-third the height of mature tree or 6 feet above ground, whichever is greater.
- No tree canopies lower than 13 feet 6 inches over roadways to allow clearance for emergency response vehicles.
- Tree trunks not allowed to intruding into the roadway.
- No trees would be planted that are listed on the Undesirable Plant List (Appendix J) No flammable understory is permitted beneath trees. Any vegetation under trees to be fire resistive and kept to 2 feet in height or below, and no more than one-third the height of the lowest limb/branch on the tree.
- No tree limbs/branches are permitted within 10 feet of a structure.

#### **7.2.2 Trail Vegetation Management**

Trails will be limited to existing dirt roads within the Otay Ranch RMP Preserve areas. Vegetation Management alongside these roads/trails is not permitted within the MSCP. Trail maintenance shall occur on the trails to remove flashy fuels and maintain the trail in a useable, low fuel condition. The Otay Ranch Preserve Owner Manager or their designee shall maintain trails within Preserve areas.

#### **7.2.3 Parks and Open Space**

Fire Safe Vegetation Management would be provided within Village parks and other greenway areas, regardless of location, in compliance with the guidelines in this plan.

- Landscaping within parks and open space areas will be in compliance with the guidelines in this plan.
- Flammable vegetation must be removed and is prohibited.
- Grasses must be maintained/mowed to 4 inches.
- Types and spacing of trees, plants, and shrubs, to comply with the criteria in this plan.
- No plants in the Undesirable Plant List (Appendix J) are permitted in this area.
- Down and dead vegetation will be removed as observed.
- Trees to be properly limbed and spaced and from approved, fire resistive plant list.

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#### **7.2.4 Vacant Parcels and Lots**

Vacant parcels and lots are subject to the following vegetation management standards.

- Vegetation management will not be required on vacant lots until construction begins. However, perimeter Vegetation Management Zones must be implemented prior to commencement of construction utilizing combustible materials.
- Vacant lots adjacent to active construction areas/lots will be required to implement vegetation management if they are within 30 feet of the active construction area. Perimeter areas of the vacant lot shall be maintained as a Vegetation Management Zone extending 30 feet from roadways and adjacent construction areas.
- Prior to issuance of a permit for any construction, grading, digging, installation of fences, etc., the 30 feet at the perimeter of the lot is to be maintained as a Vegetation Management Zone.
- In addition to the establishment of a 30-foot-wide vegetation management zone prior to combustible materials being brought on site, existing vegetation on the lot shall be reduced by at least 70% upon commencement of construction.
- Dead fuel, ladder fuel, and downed fuels shall be removed and trees/shrubs shall be properly limbed, pruned and spaced per this plan.

#### **7.2.5 MSCP Preserve/Otay Ranch RMP Preserve**

A Community Facilities District (CFD), Homeowners' Association (HOA), Otay Ranch Preserve Owner/Manager or other legal entity approved by the SDCFA and County Fire Marshal, ("Approved Maintenance Entity") shall obtain permission from the County, and/or the appropriate resource agencies (California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), Army Corps of Engineers (ACOE)) prior to conducting Vegetation management activities within the Otay Ranch RMP Preserve areas.

#### **7.2.6 Private Residential Lots**

This FPP provides direction for selecting lower flammability plant material along with planting and maintenance requirements. The 120-foot fuel modification zone, or the entire lot area between the residence and the property line, if less than 100 feet, are required to use low flammability plantings consistent with this FPP. In addition, it is recommended that none of the plant materials listed in the "Undesirable Plant List" (Appendix J) in this plan or otherwise known to be especially flammable be planted on private lots. This FPP or a summary of its key points will be provided to all buyers in a private property owner's guide to living in a fire environment. Deed restrictions will

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be recorded indicating the fuel modification zones on each private lot, as appropriate. Deed restrictions shall run with the land and be conveyed to any subsequent owner of the private lot. In addition the Alternative H Codes, Covenants, and Regulations (CC&Rs) shall include a reference to the FPP to ensure compliance with the FPP.

#### **7.2.7 Annual Fuel Modification Maintenance**

Vegetation management shall be completed annually by May 1 of each year and more often as needed for fire safety, as determined by the SDCFA. Homeowners and private lot owners shall be responsible for all vegetation management on their lots, in compliance with this FPP which is consistent with SDCFA requirements.

The “Approved Maintenance Entity” shall be responsible for and shall have the authority to ensure long term funding, ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification, vegetation management, and maintenance requirements on all private lots, multifamily residences, resort, school (SDCFA may inspect schools and enforce fuel modification requirements), parks, common areas, roadsides (including Otay Lakes Road), and open space under their control (if not considered biological open space). Any water quality basins, flood control basins, channels, and waterways should be kept clear of flammable vegetation, subject to paragraph E above. The Approved Maintenance Entity shall obtain an inspection and report from a SDCFA–authorized Wildland Fire Safety Inspector, in May of each year, certifying that vegetation management activities throughout the Alternative H Site have been performed pursuant to this FPP. This report will be funded by the Approved Maintenance Entity and submitted to SDCFA and/or the County Fire Marshal for approval.

#### **7.2.8 Annual FMZ Compliance Inspection**

The Alternative H HOA would obtain an FMZ inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector, in May of each year, certifying that vegetation management activities throughout Alternative H have been performed pursuant to this FPP. This report would be funded (the maintenance entity would contract with an approved third-party inspector) by the approved maintenance entity and submitted to SDCFA for approval. Homeowners would be provided a copy of this FPP and the FMZ maintenance requirements by the HOA or approved maintenance entity at time of purchase.

#### **7.2.9 Construction Phase Fuel Management**

Vegetation management requirements would be implemented at commencement and throughout the construction phase. Vegetation management would be performed pursuant to this FPP and SDCFA requirements on all building locations prior to the start of work and prior to any import of

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combustible construction materials. Adequate fuel breaks, as approved by SDCFA, would be created around all grading, site work, and other construction activities in areas where there is flammable vegetation. Fuel breaks would range between 50 and 100 feet around grading activities.

In addition to the requirements outlined above, Alternative H would comply with the following important risk-reducing vegetation management guidelines:

- All new power lines would be underground, for fire safety during high wind conditions or during fires on a right of way, which can expose aboveground power lines. Temporary construction power lines may be allowed in areas that have been cleared of combustible vegetation.
- A construction fire prevention plan would be prepared to minimize the likelihood of ignitions and pre-plan the site's fire prevention, protection and response plan.
- Caution must be used to avoid erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping, or irrigation. No uprooting of treated plants is necessary.

### **7.3 Road Requirements**

#### **7.3.1 Access**

##### **7.3.1.1 Access Roads**

Alternative H site access, including road widths and connectivity, will comply with the requirements of the Consolidated County Fire Code (Section 96.1.503). The County Fire Marshal and SDCFA have reviewed requests for Alternative H specific deviations from the Fire Code standards and provided input which is reflected in the Tentative Map street sections.

- Roads will be constructed to minimum 24-foot unobstructed widths and shall be improved with aggregate cement or asphalt paving materials. There shall be at least three points of primary access from Otay Lakes Road to the Alternative H site for emergency response and evacuation. A fourth dedicated entry to the resort is located at the easternmost edge of the development. Emergency access will also be provided between the resort and the residential areas. All interior residential streets will be designed to accommodate a minimum of a 75,000-lb. fire truck based on actual weight of the required aerial ladder/Quint (quintuple combination pumper).

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- Fire access road for each phase shall meet all Alternative H approved fire code requirements and/or mitigated exceptions for maximum allowable dead-end distance, paving, and fuel management prior to combustibles being brought to the site.
- Roundabouts are proposed throughout the Alternative H site and will meet County DPW and SDCFA standards.
- On-site fire lane road at commercial buildings, resort, and school (road closest to the building) will be 26 feet wide, per code or as approved by County Fire Marshal.
- Parking will be assumed to be 8 feet in width, but may be reduced on certain residential streets. Where parking lane widths are reduced below 8 feet, parking will be restricted, per the DPW Road Modification, by posting of signs stating “No Parking; Fire Lane” to preserve the 24-foot unobstructed width for emergency response. Street sections are to be reviewed and approved by the County DPW and the County Fire Marshal.
- Roads with a median or center divider will have 14 feet unobstructed width on both sides of the center median or divider. Emergency fire truck access points will be provided through the center divider at 1,000-foot intervals, where road segment length allows.

#### **7.3.1.2 Secondary Access and Turnarounds**

Secondary access and turnarounds are required for this project per the CCFC. Alternative H is consistent with the code, as follows:

- Four entrances from Otay Lakes Road to the Alternative H site are provided, three of which are remote from each other, satisfying the need for secondary access.
- Any dead end roads longer than 150 feet shall have approved provisions for fire apparatus turnaround.
- Access is provided off of Strada Piazza which connects the western portion of the Alternative H site and to the southern end of the Alternative H site via Otay Lakes Road. Additionally, Piazza Urbino provides access to the central portion of the Alternative H site off of Otay Lakes Road and connects with Circulo Almalfi. The roads are 24 feet wide, all-weather surface, constructed to DPW standards. These access routes will include automatic (pressure activated) gate for evacuation purposes, and consistent with the County Consolidated Fire Code, will be equipped with automatic strobe sensors and KNOX key switches for automatic override by first responders.
- Fire apparatus turnarounds to include turning radius of a minimum 28 feet, measured to inside edge of improved width, (CCFC 96.1.503.2.4).

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- The longest dead-end road (cul-de-sac) allowed by the County Consolidated Fire Code and CCR Title 14 is 800 feet for this community. No dead-end cul-de-sac lengths will exceed 800 feet.
- Cul-de-sac bulbs are required on dead-end roads in residential areas where roadways serve more than two residences.
- Roadways and/or driveways will provide fire department access to within 150 feet of all portions of the exterior walls of the first floor of each structure.
- Roadway design features (e.g., speed bumps, humps, speed control dips, planters, fountains) that could interfere with emergency apparatus response speeds and required unobstructed access road widths will not be installed or allowed to remain on roadways (SDCFA and County Consolidated Fire Code). Traffic Calming features (i.e., raised intersections, intersection neck downs, roundabouts and parallel bay parking with landscape pop-outs) may be allowed, subject to approval by the SDCFA and County Department of Public Works.
- Vertical clearance of vegetation along roadways will be maintained at 13 feet, 6 inches. Vertical clearance in the commercial/resort areas to be clear to the sky to allow aerial ladder truck operation.
- Angle of driveway/roadway approach/departure will not exceed 7° (12%) per Fire District.
- Road grades will not exceed 15%, unless approved by the Fire Chief (maximum 20% with mitigations).
- Developer will provide information illustrating the new roads, in a format acceptable to the Fire Authority, for updating of Fire District maps (County Fire Code, Section 96.1.505.5).
- Any roads that have traffic lights shall have Fire District–approved traffic preemption devices (Opticom) compatible with devices on the Fire Apparatus, per Fire District.

#### **7.3.2 Gates**

Alternative H access gates will comply with County Fire Code and SDCFA, Section 96.1.503.6. Public roads shall not be gated. Any gates on any private roads or on private driveways may be permitted but must comply with Fire District standards for electric gates.

- Access gates are to be equipped with a KNOX key switch, which overrides all command functions and opens the gate. Gates serving more than 4 parcels shall be equipped with sensors for detecting emergency vehicle “opticom” strobe lights from any direction of approach. Strobe detection and key switches will be provided on the interior and exterior of gates.

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- Switches may be dual keyed for Fire District and Law Enforcement access.
- Gate activation devices will be equipped with a battery backup or manual mechanical disconnect in case of power failure.
- Further, gates will be:
  - Wider than the roadway
  - Inclusive of area lighting
  - Constructed from non-combustible materials
  - Inclusive of provisions for manual operation from both sides, if power fails. Gates will have the capability of manual activation from the development side, via contact by a person or a vehicle (including a vehicle detection loop)
  - Located 30 feet from any intersecting road
  - Operable by activation with fire truck radio.

#### **7.3.3 Driveways**

Any structure that is 150 feet or more from a common road in the Alternative H development shall have a paved driveway meeting the following specifications:

- Grades less than 20% with surfacing and sub-base consistent with the CFC.
- Approved fire apparatus turnaround with radius no less than 36 feet.
- Driveways serving two houses or fewer will be 16 feet wide unobstructed with a fire apparatus turnaround. Driveways serving more than two houses will be 24 feet wide unobstructed.
- Lighted house addresses shall be posted at the entrance to each driveway if house numbers are not visible from the street.
- Driveway gates to comply with this section.

Identification of roads and structures will comply with SDCFA and CFC, Section 96.1.505), as follows:

- All structures to be identified by street address numbers at the structure. Numbers to be 4 inches in height, 0.5-inch stroke, and located 6 to 8 feet above grade. Addresses on other than residential buildings to be 6 inches high with 0.5-inch stroke. Numbers will contrast with background.



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- Multiple structures located off common driveways will include posting addresses on structures, on the entrance to individual driveways, and at the entrance to the common driveway for faster emergency response.
- Structures 100 feet or more from a roadway will include numbers at the entrance to the driveway.
- Proposed roads within the development will be named, with the proper signage installed at intersections to satisfaction of the SDCFA and the Department of Public Works (County of San Diego Standard DS-13).
- Streets will have street names posted on non-combustible street signposts. Letters/numbers will be 4 inches high, reflective, on a 6-inch-high backing. Signage will be 7 feet above grade. There will be street signs at the entrances to the development, all intersections, and elsewhere as needed subject to approval of the Fire Chief.
- Access roads to private lots to be completed and paved prior to issuance of building permits and prior to the occurrence of combustible construction.

## **7.4 Structure Requirements**

### **7.4.1 Ignition-Resistance**

This section outlines ignition-resistant construction (for all structures) that would meet the requirements of the 2017 Consolidated County Fire Code and the County Building Code (County Code of Regulatory Ordinance; Title 9, Division 2), Chapter 701-A. The following construction practices respond to the requirements of these codes and are consistent with the 2016 California Fire and Building Codes (Chapter 7-A). Code updates are likely to occur before Alternative H is fully constructed. As such, building plans must meet the “then-current” County Building Code in effect at the time of building plan submittal.

The following features are required for new development in WUI areas and form the basis of the system of protection necessary to minimize structural ignitions and to provide adequate access for emergency responders. Although these standards would provide a high level of protection to structures in this development and should reduce the potential for ordering evacuations in a wildfire, there is no guarantee that compliance with these standards would prevent damage or destruction of structures by fire in all cases.

- Exterior walls of all structures and garages to be constructed with approved non-combustible (stucco, masonry, or approved cement fiber board) or ignition-resistant material from grade to underside of roof system. Wood shingle and shake wall covering is prohibited. Any unenclosed under-floor areas will have the same protection as exterior walls. Per County Building Code, Chapter 7-A: Exterior wall coverings to extend from top

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of foundation to the underside of roof sheathing, and terminate at 2-inch nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure). The underside of any cantilevered or overhanging appendages and floor projections will maintain the ignition-resistant integrity of exterior walls, or projection will be enclosed to grade.

- Eaves and soffits will meet the requirements of SFM 12-7A-3 or be protected by ignition-resistant materials or non-combustible construction on the exposed underside, per County Building Code, Chapter 7-A.
- There shall be no use of paper-faced insulation or combustible installation in attics or other ventilated areas per County Building Code.
- There shall be no use of plastic, vinyl, or light woods on the exterior.
- All roofs shall be a Class “A” listed and fire-rated roof assembly, installed per manufacturer’s instructions, to approval of the Fire Authority and the PDS. Roofs shall be made tight with no gaps or openings on ends or in valleys, or elsewhere between roof covering and decking, in order to prevent intrusion of flame and embers. Any openings on ends of roof tiles shall be enclosed to prevent intrusion of burning debris. When provided, roof valley flashings shall not be less than 0.019 inch (No. 26 gage galvanized sheet) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72 pound ASTM 3909 cap sheet running the full length of the valley (County Building Code, Chapter 7-A).
- No vents in soffits, cornices, rakes, eaves, eave overhangs or between rafters at eaves or in other overhang areas. Gable end and dormer vents to be at least 10 feet from property line or provided alternative design resistant to ember penetration. Vents in allowed locations to be protected with wire mesh having no openings greater than 0.125 inch. Vent openings shall not exceed 144 square inches. Vents shall be designed to resist the intrusion of any burning embers or debris (County Building Code, Chapter 7-A).
- Vents shall not be placed on roofs unless they are approved for Class “A” roof assemblies (and contain an approved baffle system (such as Brandguard vents) to stop intrusion of burning material) or are otherwise approved.
- Turbine vents are prohibited.
- Exterior glazing in windows (and sliding glass doors, garage doors, or decorative or leaded glass in doors) to be dual pane with one tempered pane, or glass block or have a 20-minute fire rating. Glazing to comply with CBC Chapter 7-A.

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- Any vinyl frames to have welded corners and metal reinforcement in the interlock area to maintain integrity of the frame certified to ANSI/AAMA/NWDA 101/LS 2 97 requirements.
- Skylights to be tempered glass (County Building Code, Chapter 7-A).
- Rain gutters and downspouts to be non-combustible. They shall be designed to prevent the accumulation of leaf litter or debris, which can ignite roof edges (County Building Code, Chapter 7-A).
- Doors to conform to SFM standard 12-7A-1, or shall be of approved noncombustible construction or shall be solid core wood having stiles and rails not less than 1 3/8 inches thick or have a 20-minute fire rating. Doors to comply with County Building Code, Chapter 7-A. Garage doors to be solid core 1.75-inch-thick wood or metal, to comply with code.
- Decks and their surfaces, stair treads, landings, risers, porches, balconies to comply with language in County Building Code, Chapter 7-A and be ignition-resistant construction, heavy timber, exterior approved fire retardant wood, or approved non-combustible materials.
- Decks or overhangs projecting over vegetated slopes are not permitted. Decks to be designed to resist failing due to the weight of a firefighter during fire conditions. There will be no plastic or vinyl decking or railings. The ends of decks to be enclosed with the same type of material as the remainder of the deck.
- There shall be no combustible awnings, canopies, or similar combustible overhangs.
- All private lots at the perimeter of the Alternative H Site and those abutting the open space are required to have 6-foot solid masonry walls or other solid non-combustible wall (other than plastic or vinyl or other material that can melt) at the perimeter of the lot. An approved, listed, fire-rated glazing assembly using glazing such as “Firelite Plus” by Technical Glass Products Co., 1.800.426.0279, or equivalent, may be installed to provide for views. Final determination as to actual type of listed glazing assembly to use is up to the glazing contractor, architect, and general contractor, and is subject to approval of County Fire Marshal and Building Official.
- No wood fences to be allowed within 5 feet of structures on any lots. The first 5 feet from a structure will be non-combustible or meet the same fire resistive standards as walls. The exception is that a wood gate may be used adjacent to a structure, if there is a 5-foot length of non-combustible or fire-resistive fencing between the gate and the remainder of the fence where it abuts the structure.

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- All chimneys and other vents on heating appliances using solid or liquid fuel, including outdoor fireplaces and permanent barbeques and grills, to have spark arrestors that comply with the County Fire Code. The code requires that openings be maximum 0.5 inch. Arrestors shall be visible from the ground
- All structures shall meet the setback established in Otay Ranch Resort Village Alternative H Specific Plan.
- Any liquid propane gas LPG tanks (except small barbecue and outdoor heater tanks), firewood, hay storage, storage sheds, barns, and other combustibles shall be located at least 30 feet from structures, and, within the fuel modification zone, 30 feet from flammable vegetation. There shall be no flammable vegetation under or within 30 feet of LPG tanks, or tanks shall be enclosed in an approved ignition-resistant enclosure with 10 feet clearance of flammable vegetation around it. In no case shall a tank be closer than 10 feet from the structure (consultant recommendation). County Fire Code requires 10 feet of clearance of native vegetation, weeds, and brush from under and around LPG tanks.
- Storage sheds, barns, and outbuildings to be constructed of approved non-combustible materials, including non-combustible Class A roofs and shall be subject to the same restrictions as the main structure on lot.
- Additionally, any of the above-listed structures (i.e., outbuildings, storage sheds, barns, separate unattached garages) that are 500 square feet or more in size shall be equipped with automatic fire sprinklers. Locations, and required fuel modification zones, will be subject to approval of County Fire Marshal and the Building Official based on size of the structure. Such structures should be a minimum of 30 feet from primary structure (consultant recommendation).

#### **7.4.2 Fire Protection System Requirements**

##### **7.4.2.1 Infrastructure, Structural Fire Protection, and Fire Protection Systems**

WUI fire protection requires a systems approach, which includes the components of vegetation management, structural safeguards (both previously addressed), and adequate infrastructure. This section provides recommendations for infrastructure components:

#### **Infrastructure Recommendations**

The following conceptual recommendations are made in order to comply with the SDCFA requirements, County of San Diego PDS requirements, the California Fire Code, the County Consolidated Fire Code and nationally accepted fire protection standards, as well as additional requirements to assist in providing reasonable on-site fire protection.

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Water service will be provided by the Otay Water District. Water supply requirements include the following requirements from County Consolidated Fire Code, Section 96.1.507.2:

#### ***Fire Hydrants***

- Hydrants are subject to SDCFA approval. Hydrants to be located on the normal Fire Apparatus response side of the road at each intersection and at 350-foot spacing as required by the SDCFA (except as noted below). Where applicable, hydrants to be located at the entrance to cul-de-sac bulb (not in the bulb itself). Hydrants to be provided on each side of any divided road or highway. In areas where buildings are not directly accessed from main roadways, the hydrants on such roadways may be 1,000 feet apart.
- Hydrants to be placed at entrances to driveways, even if this results in slightly exceeding the 350 feet by up to 50 feet.
- Per the SDCFA Code, hydrants shall be provided every 300 feet in resort area, multifamily dwellings, and at the school.
- The water system for fire protection to be an approved water supply with hydrants and mains. Fire flow in the mains for residential occupancies to be at least 2,500 gallons per minute (gpm) in fire mains with a 20-psi residual at periods of maximum peak domestic demand. Fire flow for the multifamily, resort, and commercial occupancies to be a minimum of 2,500 gpm in fire mains and to County Consolidated Fire Code. No credit for sprinklers is available in wildfire prone areas. Duration of flow is 2 hours or more if required by the County Consolidated Fire Code based on the required flow. The amount of stored water for fire protection to be for the required duration (minimum 2 hours) at the worst-case fire flow at times of maximum peak domestic and commercial demand (including agriculture). Any private water systems to comply with National Fire Protection Association (NFPA) 22 and 24. In addition, fire protection water systems to comply with American Water Works Association Standard M-31; “Distribution Requirements for Fire Protection.”
- Hydrants to have one 2.5-inch outlet and one 4-inch outlet and be of bronze construction per the District Fire Code. Hydrants at resort, commercial buildings, and school to have two 4-inch outlets and one 2.5-inch outlet. Fire protection engineer to make determination whether dry barrels are necessary due to freeze potential.
- Hydrants to have a 3×3 concrete pad at base (gravel if dry barrel hydrant) for weed control.
- Reflective blue dot hydrant markers to be installed in the street to indicate location of the hydrant. Red dot markers are required for all sprinkler systems other than those in detached single-family dwellings.
- The lateral shut-off valve will be located in the street 10–25 feet in front of hydrant.

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- Crash posts will be provided where needed on site areas where vehicles could strike fire hydrants, fire department connections, etc.

#### ***Fire Sprinklers***

All structures, of any occupancy type, are required by the SDCFA to have internal fire sprinklers. (Exception may be granted by Fire Authority for detached accessory structures under 500 square feet). One- and two-family residences may have NFPA 13-D systems. Residential structures 7,000 square feet and larger may be required to have a 4-head calculation. Enclosed patios porches, workshops, barns, storage structures, separate unattached garages, RV structures, and auxiliary use rooms over 500 square feet also to have sprinkler protection.

Other occupancies, such as the resort hotel, 3 or more stories in height, or 20 or more guests, shall have a sprinkler system in compliance with NFPA 13, per the Fire Code Section 96.1.903.2. Actual system design is subject to final building design and the occupancy types in the structure. All other occupancies in this development shall have fire sprinklers in compliance with the SDCFA requirements and NFPA 13. All systems other than single-family detached dwelling systems to be remotely supervised to an approved 24/7 alarm company. A pressure of more than the minimum 20 PSI will most likely be needed to supply fire sprinklers in certain structures, and for certain in the resort building. This must be determined in the water system design phase.

#### **7.4.3 Additional Requirements and Recommendations Based on Occupancy Type**

This section includes conceptual occupancy-specific recommendations based on the type of occupancy.

##### **Additional Alternative H Resort Complex/ Hotel/ Commercial Building Requirements and Recommendations**

- On-site fire lane roadways will be 26 feet unobstructed by parking to within 150 feet of all portions of the exterior wall. Roadways will be clear to the sky with no overhead obstructions. Turning radius and actual location and configuration of on-site roads will be subject to SDCFA approval when detailed plans are submitted and will be located to facilitate proper and safe operation of Fire Authority ground and aerial ladders.
- The primary travel road to the resort shall have at least 1 ingress lane and 2 egress lanes. The road will have 30 feet of vegetation management zone on the Preserve side of the road and 20 feet of vegetation management on the development side of the road with irrigated, low flammability vegetation and sparse planting.
- The Resort will be designed in coordination with SDCFA to ensure that acceptable firefighter access is accommodated via typical fire engine ground ladders.

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- Any overhang over an entrance where vehicles may drive or park will include a fire sprinkler system to protect against a fire in vehicles, including buses.
- Red dot markers are required in road at location of Fire Department sprinkler connections.
- Fire sprinkler system and valves will be remotely supervised by an alarm monitoring company that is U.L. listed for fire, or accepted by SDCFA. The riser and valves will be located on exterior or in a 1-hour rated room directly accessible from exterior.
- Sprinkler fire department connection to be located about 4 to 10 feet in from curb of main access road in front of main building, 40 feet or more from building. A fire hydrant shall be located within 50 feet of the connection.
- Provide a wet standpipe system in any building over 2 stories from grade accessible to a fire engine, and in any large public assembly room (conference center, auditorium, etc.). A wet standpipe system shall be installed elsewhere where required by County Fire Code.
- Provide two points of fire truck access to applicable structures. Actual location of roads will be subject to SDCFA approval at time of detailed plans for the resort/hotel.
- Provide approved 4-foot-wide firefighter foot and gurney access to pool and recreation areas from the closest parking location for an emergency vehicle.
- Unless an approved fire truck turnaround is provided, on-site, dead-end roads over 150 feet in length are prohibited.
- Provide firefighter access doors every 100 feet around perimeter of building high occupancy buildings.
- Provide adequate enclosed, fire-rated stairways to all floors for firefighter access and evacuation; one to terminate at the roof. Stairways will be in smoke proof rated enclosures.
- Provide a SDCFA–approved method of smoke removal from the building.
- Provide 6-foot-wide firefighter access paths around perimeters of buildings.
- Place fire hydrants every 300 feet on the on-site Resort road and on access road fronting the property.
- Provide hydrants, post-indicator valves, and Fire Department sprinkler connections with adequate vehicle crash protection.
- Provide the appropriate fire-extinguishing systems in restaurants where required for cooking operations.
- Elevators and controls are subject to SDCFA approval.

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- Any building qualifying as a high-rise building, if any, will comply with all high-rise fire protection requirements.
- Provide supervised smoke detection.
- Provide manual fire alarms.
- Provide an emergency announcement system, if applicable, to final design of buildings.
- Locate graphic alarm annunciator on exterior at front door and other significant access points if required by SDCFA.
- Provide firefighter control room an exterior accessible location for use in monitoring all fire alarms and reviewing building maps and communicating during a fire or other emergency (subject to final design and size of resort).
- Provide required fire extinguishers.
- Any other commercial occupancy will comply with SDCFA and Fire and Building Code requirements for the particular occupancy.
- Any outside storage to comply with Fire Code and SDCFA requirements.
- Individual buildings will not exceed 40,000 square feet without having approved, fire-rated, firewalls partitioning every 40,000 square feet (or less if required by the specific building) or other equivalent fire protection such as a smoke detection system in addition to the sprinklers.
- Occupancy design and layout will comply with the County Building and Fire Codes.
- All final plans will be subject to approval of the SDCFA.

#### **School**

- Building Plans will be subject to approval of the State Architect. Access, water supply and hydrant plans are subject to SDCFA approval.



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## **8 ALTERNATIVE H DESIGN CONSIDERATIONS FOR NON-CONFORMING FUEL MODIFICATION**

As previously mentioned, the available area for FMZ for approximately 22 lots around the perimeter of the Vernal Pool Preserve Open Space Area (OS Lot E) is limited. As such, this FPP incorporates the use of a heat-deflecting view wall that will be positioned at the rear yard lot line. This additional fire protection measure is customized for this site based on the analysis results and focus on providing functional equivalency as a 100 feet wide fuel modification zone adjacent to designated Vernal Pool Preserve land. The vernal pool area is typically similar to a low fuel modified zone.

Research has indicated that the closer a fire is to a structure, the higher the level of heat exposure (Cohen 2000). However, studies indicate that given certain assumptions (e.g., 10 meters of low fuel landscape, no open windows), wildfire does not spread to homes unless the fuel and heat requirements (of the home) are sufficient for ignition and continued combustion (Cohen 1995, Alexander et al. 1998). Construction materials and methods can prevent or minimize ignitions. Similar case studies indicate that with nonflammable roofs and vegetation modification from 10–18 meters (roughly 32–60 feet) in southern California fires, 85–95% of the homes survived (Howard et al. 1973, Foote and Gilles 1996). Similarly, San Diego County after fire assessments indicate strongly that the building codes are working in preventing home loss: of 15,000 structures within the 2003 fire perimeter, 17% (1,050) were damaged or destroyed. However, of the 400 structures built to the 2001 codes (the most recent at the time), only 4% (16) were damaged or destroyed. Further, of the 8,300 homes that were within the 2007 fire perimeter, 17% were damaged or destroyed. A much smaller percentage (3%) of the 789 homes that were built to 2001 codes were impacted and an even smaller percentage (2%) of the 1,218 structures built to the 2004 Codes were impacted (IBHS 2008). Damage to the structures built to the latest codes is likely from flammable landscape plantings or objects next to structures or open windows or doors (Hunter 2008).

These results support Cohen's (2000) findings that if a community's homes have a sufficiently low home ignitability (i.e., 2017 San Diego County Consolidated Code and 2016 California Building Code), the community can survive exposure to wildfire without major fire destruction. This provides the option of mitigating the wildland fire threat to homes/structures at the residential location without extensive wildland fuel reduction. Cohen's (1995) studies suggest, as a rule-of-thumb, larger flame lengths and widths require wider fuel modification zones to reduce structure ignition. For example, valid Structure Ignition Assessment Model (SIAM) results indicate that a 20-foot high flame has minimal radiant heat to ignite a structure (bare wood) beyond 33 feet (horizontal distance). Whereas, a 70-foot high flame may require about 130 feet of clearance to prevent structure ignitions from radiant heat (Cohen and Butler 1996). This study utilized bare wood, which is more combustible than the ignition resistant exterior walls for structures built today.

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Obstacles, including non-combustible walls can block or deflect all or part of the radiation and heat, thus making narrower fuel modification distances possible. Fire behavior modeling conducted for Alternative H indicates that sage scrub fires in the Vernal Pool Open Space Area (OS Lot E) would result in roughly 14-foot flame lengths under summer conditions. Extreme conditions may result in longer flame lengths, approaching 20 feet in sage scrub plant community.

As indicated in this report, the FMZs and additional fire protection measure proposed for Alternative H provide equivalent wildfire buffer, but are not standard zones (100 feet in width) for structures adjacent to Preserve designated land. Rather, they are based on a variety of analysis criteria including predicted flame length, fire intensity (Btu), site topography and vegetation, extreme and typical weather, position of structures on pads, position of roadways, adjacent fuels, fire history, current vs. proposed land use, neighboring communities relative to Alternative H, and type of construction. The fire intensity research conducted by Cohen (1995), Cohen and Butler (1996), and Cohen and Saveland (1997) and Tran et al. (1992) supports the fuel modification alternative proposed for the Vernal Pool Open Space Preserve Area.

#### **8.1 Heat Deflecting View Wall**

Alternative H's slopes in the areas of concern along with the slightly elevated lots/pads provide an opportunity to place a non-combustible, six foot tall, heat-deflecting wall (lower 1 to 2 feet block wall and upper 4 to 5 feet dual pane, one pane tempered glazing or a six feet high concrete block wall) to provide additional deflection for these lots (Figure 8).

Walls have proven to deflect heat and airborne embers on numerous wildfires in San Diego, Orange, Los Angeles, Ventura, and Santa Barbara County. Rancho Santa Fe Fire Protection District, Laguna Beach Fire Department, Orange County Fire Authority, and other fire agencies utilize these walls as alternative methods based on observed performance during wildfires. This has led to these agencies approving use of non-combustible landscape walls as mitigations for reduced fuel modification zones and reduced setbacks at top of slope. These walls are consistent with NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire – 2008 Edition, Section 5.1.3.3 and A.5.1.3.3 and International Urban Wildland Interface Code (ICC 2012). NFPA 1144, A.5.1.3.3 states: "Noncombustible walls and barriers are effective for deflecting radiant heat and windblown embers from structures." These walls and barriers are usually constructed of noncombustible materials (concrete block, bricks, stone, stucco) or earth with emergency access openings built around a development where 100 feet of defensible space is not available.

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**Figure 8. Example of Heat Deflecting View Wall**



**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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## **Fire Protection Plan**

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## **9 WILDLAND URBAN INTERFACE PRE FIRE PLAN**

A Wildland Urban Interface Pre Fire Plan (WUI) has been prepared for the Otay Ranch Resort Village Alternative H Community by the County of San Diego Fire Department/CalFire prior to occupancy. The WUI provides operational approaches for various emergency situations, including wildfire

### **9.1 Wildfire Education**

Village residents and occupants of commercial and resort facilities will be provided on-going education regarding wildfire and this FPP's requirements. This educational information will support the fire safety and relocation features designed for this community and available to responding emergency personnel. Informational handouts, community Web-site page, mailers, fire safe council participation, inspections, seasonal reminders, and resort check-in handouts are some methods that will be used to disseminate wildfire and relocation awareness information. The Fire Authority Having Jurisdiction will review and approve all wildfire educational material/programs before printing and distribution.

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## **10 CUMULATIVE IMPACT ANALYSIS**

Cumulative impacts from multiple projects within a fire agency's jurisdiction, like SDCFA, can cause fire response service decline and must be analyzed. Alternative H represents a development that would increase the existing call volume by roughly two calls per day, on average. The resulting impact of the proposed Alternative H on fire services has been analyzed within this report and despite the population increase and anticipated call volume increase, the existing fire service delivery system is considered underutilized on a call volume basis, per an analysis of SDCFA call volume statistics<sup>4</sup> and has capacity to serve Alternative H. When compared to standard utilization rates for busy (five or six calls per day for a rural station) fire stations (Hunt 2010), it is clear there is capacity to serve Alternative H.

However, the system needs to be augmented to respond to a population change like that associated with Alternative H within a proportional timeframe. The County General Plan's 5-minute travel time standard is one part of the process for determining whether existing fire departments can respond to Alternative H or whether additional resources are necessary. Further, when considered cumulatively with other potential projects planned in the area or within automatic aid response areas, the cumulative impact is considered potentially significant.

Despite the minor increase in number of calls per year from Alternative H, it contributes to the cumulative impact on fire services, when considered with other anticipated projects within the SDCFA's primary response area. The largest potential project in addition to the proposed Alternative H in this portion of SDCFA's jurisdictional area is Otay Ranch Village 14 and Planning Area 16/19 Project, which is pending approvals. Village 14 and Planning Area 16/19 Project is anticipated to generate less than one call per day and is situated in a portion of the SDCFA that cannot be completely responded to within the County's 5-minute travel time from existing stations. Village 14 and Planning Area 16/19, like the Otay Ranch Village Project Alternative H, has been conditioned to provide a permanent fire station that will meet the County's General Plan standard and be capable of responding to and assisting with calls beyond the Alternative H development, as requested. Based on the proposed Alternative H and the proposed Village 14 and Planning Area 16/19 Project, SDCFA has committed to realigning resources to better serve the area. Therefore, this portion of the County will have enhanced fire and emergency medical service if one or both projects are approved. These additional stations, if the Village 14 and Planning Area 16/19 and the proposed Alternative H are approved and built, will mitigate cumulative impacts associated with the projects along with numerous smaller developments that may occur in the area.

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<sup>4</sup> SDCFA Fire Station 36 currently responds to approximately one call per day (2012 statistics).



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The proposed Alternative H's contributions to fire resources through building a new public safety center, along with funding for equipment and ongoing operations and maintenance are expected to enhance SDCFA's response capabilities and enhance the current standards for firefighting and emergency response in this portion of the SDCFA. Over the long term, it is anticipated that SDCFA will be able to perform its mission into the future at levels consistent with the County Consolidated Fire Code and the San Diego County General Plan.

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### 11 CONCLUSION

This FPP complies with the requirements of the County Consolidated Fire Code and the California Fire and Building Codes. The recommendations in this document meet and exceeds the fire safety, building design elements, infrastructure, fuel management/ modification, and landscaping recommendations of the applicable codes. The recommendations provided in this FPP have been designed specifically for the proposed construction of structures within a WUI area.

When properly implemented on an ongoing basis, the fire protection strategies proposed in this FPP should significantly reduce the potential fire threat to vegetation on the community and its structures and should assist the fire authority in responding to emergencies in the Alternative H Area. The proposed Alternative H's fire protection system includes a redundant layering of protection methods that have been shown through post-fire damage assessments to reduce risk of structural ignition. Modern infrastructure would be provided along with implementation of the latest ignition-resistant construction methods and materials. Further, all structures are required to include interior, automatic fire sprinklers consistent with the fire codes. Fuel modification would occur on perimeter edges adjacent to Otay Ranch MSCP Preserve and throughout the interior of the Alternative H site. This is a conceptual plan, which provides enough detail for SDCFA approval. Detailed plans such as improvement plans and building permits, demonstrating compliance with the concepts in this FPP and with Fire Code requirements, would be submitted to the fire authority at the time they are developed.

Based on the results of this FPP's analysis and findings, the FPP implementation measures presented in Table 7 summarize code-required measures, and Table 8 summarizes measures offered that are code exceeding or mitigating through alternative means and methods.

**Table 7**  
**Code-Required Fire Safety Features**

Feature No.	Features Description
1	<b>Ignition-Resistant Construction.</b> Proposed Alternative H buildings would be constructed of ignition-resistant construction materials based on the latest Building and Fire Codes.
2	<b>Interior Fire Sprinklers.</b> All structures over 500 square feet would include interior fire sprinkler system per occupancy type.
3	<b>Fuel Modification Zones – Resort Village.</b> Provided throughout the perimeter of the Development Footprint and would be up to 120 feet wide, including the rear yard areas as part of the modified zone. Maintenance would occur as needed, and the HOA would annually hire a third party, SDCFA-approved, FMZ inspector to provide annual certification that both private and HOA FMZ areas meet the requirements of this FPP.
4	<b>Roadside Fuel Modification Zones.</b> Roadside FMZs would be consistent with the code for Resort Village. FMZ width would be 20 feet on either side of all proposed Alternative H roads.

## Fire Protection Plan

### The Otay Ranch Resort Village - Alternative H Project

**Table 7**  
**Code-Required Fire Safety Features**

Feature No.	Features Description
6	<b>Fire Apparatus Access.</b> Provided throughout the community and would vary in width and configuration, but would all provide at least the minimum required unobstructed travel lanes, lengths, turnouts, turnarounds, and clearances required by the applicable code.
7	<b>Firefighting Improvements.</b> Firefighting staging areas and temporary refuge areas are available throughout the proposed Alternative H's developed areas and along roadways and HOA open space.
8	<b>Water Availability.</b> Water capacity and delivery would provide for a reliable water source for operations and during emergencies requiring extended fire flow.
9	<b>Alternative H area Fire Station.</b> Emergency response travel time consistent with the San Diego County General Plan requirement for the proposed Alternative H would be provided by a Alternative H Area fire station. Travel times to all portions of Alternative H Area would be within General Plan standards, less than 5 minutes.

**Table 8**  
**Code Exceeding or Alternative Materials and Methods Fire Safety Measures**

Measure No.	Code Exceeding or Alternative Material or Method Measure
1	<b>Construction Fire Prevention Plan.</b> Details the important construction phase restrictions and fire safety requirements that would be implemented to reduce risk of ignitions and pre-plans for responding to an unlikely ignition.
2	<b>Community Evacuation Plan.</b> A proposed Alternative H-specific evacuation plan would be prepared for Alternative H and would include input and review with SDCFA. (Code Exceeding)
3	<b>HOA Wildfire Education and Outreach.</b> The Community HOA would include an outreach and educational role to coordinate with SDCFA, oversee landscape committee enforcement of fire safe landscaping, ensure fire safety measures detailed in this FPP have been implemented, and educate residents on and prepare facility-wide "Ready, Set, Go!" plans. (Code Exceeding)
4	<b>Heat Deflecting Landscape Walls.</b> Walls would be provided for 22 lots around the perimeter of the Vernal Pool Preserve Open Space Area (OS Lot E) to provide additional fire protection and to enhance structure setback from open space area..
5	<b>Fuel Modification Zone Third-Party Inspections.</b> Annual FMZ inspections would be funded by the HOA and conducted by a qualified third-party consultant to certify that Alternative H's FMZs private and HOA FMZ areas are maintained.
6	<b>Trail Maintenance.</b> Provided trails would include ongoing maintenance of flammable vegetation, not including alongside trails. (Code Exceeding)

Fire is a dynamic and somewhat unpredictable occurrence and as such, this plan does not guarantee that a fire will not occur or will not result in injury, loss of life or loss of property. There are no warranties, expressed or implied, regarding the suitability or effectiveness of the recommendations and requirements in this plan, under all circumstances.

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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The developers, contractors, engineers, and architects are responsible for proper implementation of the concepts and requirements set forth in this Plan. Homeowners and property managers are responsible to maintain their structures and lots as required by this FPP, the SDCFA, and as required by the Fire Code. Alternative methods of compliance with this Plan can be submitted to the fire authority and County Fire Marshal for consideration.

It will be extremely important for all homeowners, property managers, and occupants to comply with the recommendations and requirements described and required by this FPP on their property. The responsibility to maintain the fuel modification and fire protection features required for Alternative H lies with the homeowners and business owners. The HOA or similar entity will be responsible for ongoing education and maintenance of the common areas, while the fire authority would enforce the vegetation management requirements detailed in this FPP. Such requirements shall be made a part of deed encumbrances and CC&Rs for each lot, as appropriate.

**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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# Fire Protection Plan

## The Otay Ranch Resort Village - Alternative H Project

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### 12 REFERENCES

- Alexander, M.E. 1998. Crown fire thresholds in exotic pine plantations of Australasia. Australian National University, Canberra, Australian Capital Territory. Ph.D. Thesis. 228p.
- Andrews, Patricia L., Collin D. Bevins, and Robert C. Seli. 2004. *BehavePlus fire Modeling System, Version 3.0: User's Guide*. Gen. Tech. Rep. RMRS-GTR-106 Ogden, UT: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132p.
- Butler, B.W., J. Cohen, D.J. Latham, R.D. Schuette, P. Spoko, K.S. Shannon, D. Jimenez, and L.S. Bradshaw. 2004. Measurements of radiant emissive power and temperatures in crown fires. *Canadian Journal of Forest Research*. 34:1577–1587.
- Cohen, J.D. 1995. Structure ignition assessment model (SIAM). In: Weise, D.R.; Martin, R.E., technical coordinators. *Proceedings of the Biswell symposium: fire issues and solutions in urban interface and wildland ecosystems*. 1994 February 15–17; Walnut Creek, California. Gen. Tech. Rep. PSW-GTR-158. Albany, California: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 85–92.
- Cohen, J.D. 2000. Preventing disaster: home ignitability in the wildland-urban interface. *Journal of Forestry* 98(3): 15-21.
- Cohen, J.D. and Butler, B.W. [In press]. 1996. Modeling potential ignitions from flame radiation exposure with implications for wildland/urban interface fire management. In: *Proceedings of the 13th conference on fire and forest meteorology*. October 27-31; Lorne, Victoria, Australia. Fairfield, Washington: International Association of Wildland Fire.
- Cohen, J.D. and Saveland, J. 1997. Structure Ignition Assessment Can Help Reduce Fire Damages in the W-UI. *Fire Management Notes* 57(4): 19-23.
- County of San Diego. 2011. San Diego County General Plan. A Plan for Growth, Conservation, and Sustainability. August 2011. <http://www.sandiegocounty.gov/pds/generalplan.html>.
- Dudek. 2015. Otay Ranch Resort Village *Biological Resources Technical Report, San Diego County, California*. March 2015.
- Dudek. 2018. Village 13 Alternative H Biological Resources Review memorandum of March 2, 2018.
- Finney, M.A. 2004. FlamMap 3.0. Missoula, MT: USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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- Foote, Ethan I.D.; Gilles, J. Keith. 1996. Structural survival. In: Slaughter, Rodney, ed. California's I-zone. Sacramento, California: CFESTES; 112-121.
- FRAP (Fire and Resource Assessment Program). 2016. California Department of Forestry and Fire Protection. Website Accessed April 2018. <http://frap.cdf.ca.gov/>
- Hall, John R. 2013. US Experience with Sprinklers. National Fire Protection Association Report. 91 pp.
- Howard, Ronald A.; North, D. Warner; Offensend, Fred L.; Smart, Charles N. 1973. Decision analysis of fire protection strategy for the Santa Monica mountains: an initial assessment. Menlo Park, California: Stanford Research Institute. 159 p.
- Hunt, J. 2010. Personal communication with J. Hunt, retired fire Battalion Chief and past fire protection planning consultant, with M. Huff of Dudek.
- Hunter, Cliff. 2008. Personal communication with Rancho Santa Fe Fire Protection District Fire Marshal (now retired) following after-fire loss assessments.
- Institute for Business and Home Safety. 2008. *Mega Fires: The Case for Mitigation*. The Witch Creek Wildfire, October 21 – 31, 2007. 47 pp.
- LAFCO (San Diego Local Agency Formation Commission). 2003. Funding Fire Protection –an Overview of Funding Issues facing Fire Protection Districts. <http://www.sdlafco.org/document/FireFunding03.pdf>
- LAFCO. 2005. Fire Protection and Emergency Medical Services Review. <http://www.sdlafco.org/document/Fire%20Protection%20&%20EMS%20MSR.pdf>
- Orange County Fire Authority. 2008. After Action Report – Freeway Complex Fire. 125 pp.
- Otay Ranch. 1993. “Otay Subregional Plan, Volume 2.” *Subregional Plan (SRP)*. Applicant: Otay Vista Associates. Prepared for Otay Ranch Joint Planning Project. Approved by: City of Chula Vista and County of San Diego. October 28, 1993.
- San Diego, County of. 2008. Hybrid Plan. San Diego County Fire Enhancement Program.
- Scott, Joe H. and Robert E. Burgan 2005. *Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model*. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

## **Fire Protection Plan**

### **The Otay Ranch Resort Village - Alternative H Project**

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Syphard AD, Keeley JE. 2016. Historical reconstructions of California wildfires vary by data source. *International Journal of Wildland Fire* 25, 1221-1227. doi:10.1071/WF16050

Tran, H.C.; Cohen, J.D; Chase, R.A. 1992. Modeling ignition of structures in wildland/urban interface fires. In: Proceedings of the 1st international fire and materials conference; 1992 September 24-25; Arlington, Virginia. London, United Kingdom: Inter Science Communications Limited; 253-262.

USFS (United States Forest Service). 2015. Wildland Fire Assessment System. Various Fire Danger Ratings and Tools to Determine Fuel Moistures, Weather Conditions, and Fire Danger. <http://www.wfas.net/>.

Weise, D.R. and J. Regelbrugge. 1997. Recent chaparral fuel modeling efforts. Prescribed Fire and Effects Research Unit, Riverside Fire Laboratory, Pacific Southwest Research Station. 5p.



**Fire Protection Plan**  
**The Otay Ranch Resort Village - Alternative H Project**

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# **APPENDIX A**

## *Site Photographs*





# PHOTOGRAPH LOG

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Otay Ranch Resort Village



**Photograph 1.** Existing fuels condition of Resort Village property looking north towards Jamul Mountain Range.



**Photograph 2.** Another view of fuel types and terrain within and outside of the property boundaries.



**Photograph 3.** Photograph depicts fuel types (short, non-native grasses and coastal sage scrub (CSS); and chamise-chaparral-Jamul Mtn. slopes). CSS used for modeling fire behavior on and adjacent project site.



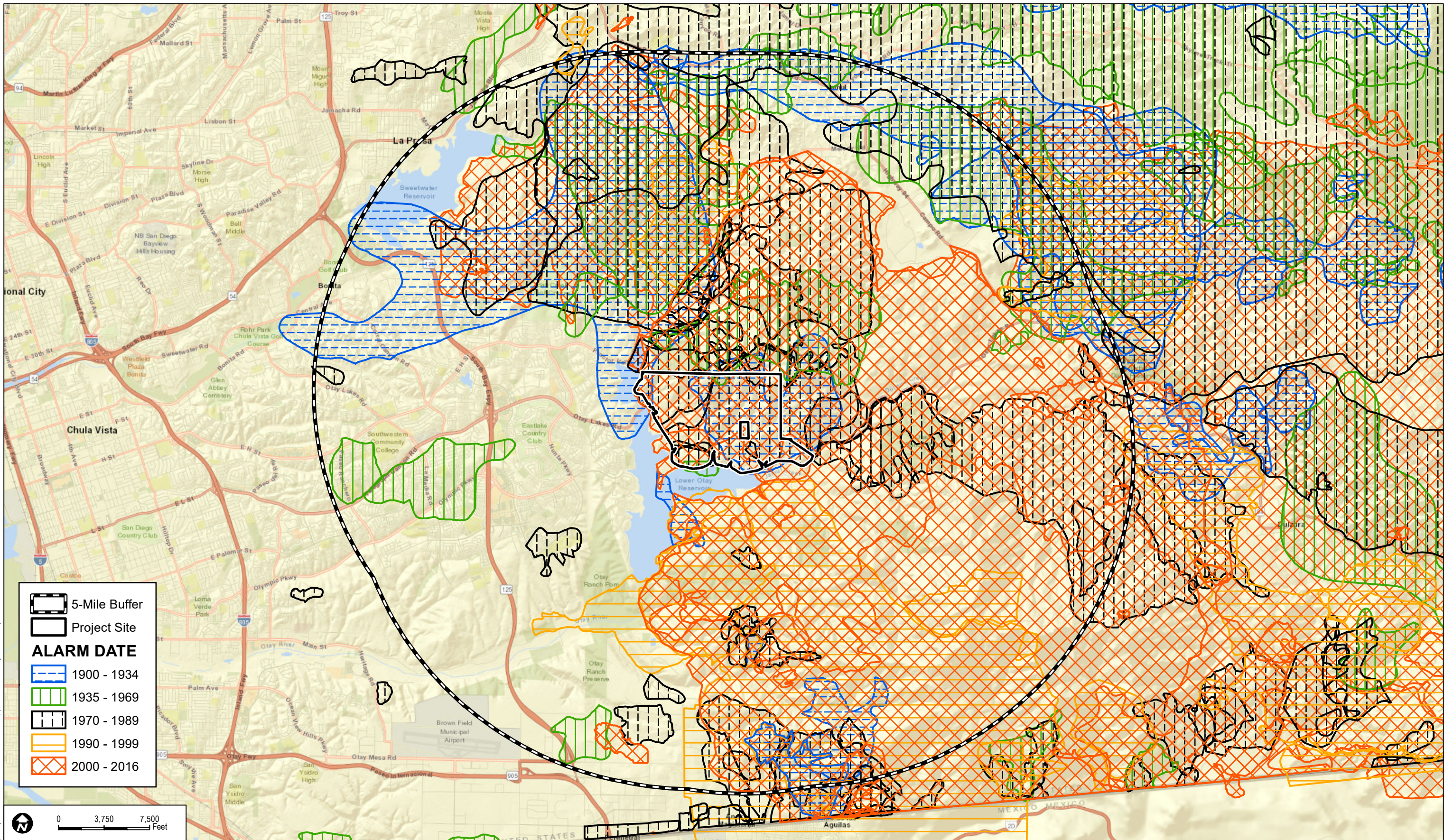
**Photograph 4.** Otay Lakes Road meanders around the southern border of the Otay Ranch Resort Village Project site.

**APPENDIX B**  
*Vicinity Fire History Map*





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\*Source: California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (<http://frap.cdf.ca.gov>). Fire data through 2016.

DUDEK

APPENDIX B  
Vicinity Fire History

Otay Ranch Resort Village □ Alternative H Fire Protection Plan





**APPENDIX C**  
*Fire Service Availability Form*





County of San Diego, Planning & Development Services  
**PROJECT FACILITY AVAILABILITY - FIRE**  
**ZONING DIVISION**

Please type or use pen

Moller Otay Lakes Development, LLC	805-299-8214
Owner's Name	Phone
6591 Collins Drive, E-11	
Owner's Mailing Address	Street
Moorpark	CA 93021
City	State Zip

ORG \_\_\_\_\_  
ACCT \_\_\_\_\_  
ACT \_\_\_\_\_  
TASK \_\_\_\_\_  
DATE \_\_\_\_\_ AMT \$ \_\_\_\_\_

DISTRICT CASHIER'S USE ONLY

**SECTION 1. PROJECT DESCRIPTION** **TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM) ☒ Specific Plan or Specific Plan Amendment  
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance: \_\_\_\_\_  
☐ Boundary Adjustment  
☐ Rezone (Reclassification) from \_\_\_\_\_ to \_\_\_\_\_ zone  
☒ Major Use Permit (MUP), purpose: Resort - 200 rooms  
☐ Time Extension... Case No. \_\_\_\_\_  
☐ Expired Map... Case No. \_\_\_\_\_  
☐ Other \_\_\_\_\_

B. ☒ Residential Total number of dwelling units 1,938  
☒ Commercial Gross floor area 20,000  
☐ Industrial Gross floor area \_\_\_\_\_  
☐ Other Gross floor area \_\_\_\_\_

C. Total Project acreage 1869 Total lots 1,950 Smallest proposed lot 5,000sf

Assessor's Parcel Number(s)  
(Add extra if necessary)


Thomas Guide. Page 1293 Grid A-J: 1-6  
Otay Lakes Road, County of San Diego  
Project address Street  
Otay Subregional Plan, V.2 91915  
Community Planning Area/Subregion Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: \_\_\_\_\_ Date: 9/19/18  
Address: 6591 Collins Drive, E-11, Moorpark, CA 93021 Phone: 805-299-8214  
(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

**SECTION 2: FACILITY AVAILABILITY** **TO BE COMPLETED BY DISTRICT**

District Name: San Diego County Fire Authority

Indicate the location and distance of the primary fire station that will serve the proposed project:  
New fire station to be built within the development

A. ☒ Project is in the District and eligible for service.  
☐ Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.  
☐ Project is not in the District and not within its Sphere of Influence boundary.  
☐ Project is not located entirely within the District and a potential boundary issue exists with the \_\_\_\_\_ District.

B. ☐ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is \_\_\_\_\_ minutes.  
☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.

C. ☐ District conditions are attached. Number of sheets attached: \_\_\_\_\_  
☒ District will submit conditions at a later date.

**SECTION 3. FUELBREAK REQUIREMENTS**

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by Planning & Development Services.

☒ Within the proposed project 100 feet of clearing will be required around all structures.  
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature: \_\_\_\_\_ Print Name and Title: JAMES PINE, Asst. FM Phone: 858.495.5434 Date: 7/9/18

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:  
Planning & Development Services - Zoning Counter, 5510 Overland Ave., Suite 110, San Diego, CA 92123





County of San Diego, Planning & Development Services  
**PROJECT FACILITY AVAILABILITY - FIRE**  
**ZONING DIVISION**

Please type or use pen

Baldwin & Sons	619-515-9109	ORG _____	<b>F</b>
Owner's Name	Phone	ACCT _____	
610 W. Ash Street, Suite 1500		ACT _____	
Owner's Mailing Address	Street	TASK _____	
San Diego	CA 92101	DATE _____ AMT \$ _____	
City	State Zip	DISTRICT CASHIER'S USE ONLY	

**SECTION 1. PROJECT DESCRIPTION** **TO BE COMPLETED BY APPLICANT**

- A. ☐ Major Subdivision (TM) ☒ Specific Plan or Specific Plan Amendment  
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance: \_\_\_\_\_  
☐ Boundary Adjustment  
☐ Rezone (Reclassification) from \_\_\_\_\_ to \_\_\_\_\_ zone.  
☒ Major Use Permit (MUP), purpose: Resort - 200 rooms  
☐ Time Extension... Case No. \_\_\_\_\_  
☐ Expired Map... Case No. \_\_\_\_\_  
☐ Other \_\_\_\_\_
- B. ☒ Residential ..... Total number of dwelling units 1,938  
☒ Commercial ..... Gross floor area 20,000  
☐ Industrial ..... Gross floor area \_\_\_\_\_  
☐ Other ..... Gross floor area \_\_\_\_\_
- C. Total Project acreage 1869 Total lots 1,950 Smallest proposed lot 5,000sf

Assessor's Parcel Number(s)  
 (Add extra if necessary)


Thomas Gulde. Page 1293 Grid A-J: 1-6

Otay Lakes Road, County of San Diego  
 Project address \_\_\_\_\_ Street \_\_\_\_\_

Otay Subregional Plan, V.2 91915  
 Community Planning Area/Subregion Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [Signature] Date: July 5, 2018  
 Address: 610 W. Ash Street, Suite 1500, San Diego, CA 92101 Phone: 619-515-9109  
 (On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

**SECTION 2: FACILITY AVAILABILITY** **TO BE COMPLETED BY DISTRICT**

District Name: San Diego County Fire Authority

Indicate the location and distance of the primary fire station that will serve the proposed project:  
New fire station to be built within the development

- A. ☒ Project is in the District and eligible for service.  
☐ Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.  
☐ Project is not in the District and not within its Sphere of Influence boundary.  
☐ Project is not located entirely within the District and a potential boundary issue exists with the \_\_\_\_\_ District.
- B. ☐ Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is 2.5 minutes.  
☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.
- C. ☐ District conditions are attached. Number of sheets attached: \_\_\_\_\_  
☒ District will submit conditions at a later date.

**SECTION 3. FUELBREAK REQUIREMENTS**

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by Planning & Development Services.

- ☒ Within the proposed project 100 feet of clearing will be required around all structures.  
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature: [Signature] Print Name and Title: JAMES PINE, Asst. FM Phone: 858-495-5434 Date: 7/9/18

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:  
 Planning & Development Services - Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123



**APPENDIX D**  
*Water Service Availability Form*







County of San Diego, Planning & Development Services  
**PROJECT FACILITY AVAILABILITY - WATER**  
**ZONING DIVISION**

Please type or use pen

Lakeview 1, LLC; Lakeview 2, LLC; Moller Otay Lakes Investment, LLC 619 515-9109  
Owner's Name Phone  
610 West Ash Suite 1500  
Owner's Mailing Address Street  
San Diego CA 92101  
City State Zip

ORG \_\_\_\_\_  
ACCT \_\_\_\_\_  
ACT \_\_\_\_\_  
TASK \_\_\_\_\_  
DATE \_\_\_\_\_

AMT \$ \_\_\_\_\_

DISTRICT CASHIER'S USE ONLY

W

**SECTION 1. PROJECT DESCRIPTION**

**TO BE COMPLETED BY APPLICANT**

- A. ☒ Major Subdivision (TM) ☒ Specific Plan or Specific Plan Amendment  
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance: \_\_\_\_\_  
☐ Boundary Adjustment  
☒ Rezone (Reclassification) from S-87/S-88 to S-80/S-88 zone.  
☐ Major Use Permit (MUP), purpose: \_\_\_\_\_  
☐ Time Extension... Case No. \_\_\_\_\_  
☐ Expired Map... Case No. \_\_\_\_\_  
☐ Other \_\_\_\_\_

Assessor's Parcel Number(s)  
(Add extra if necessary)

See Attached

- B. ☒ Residential ..... Total number of dwelling units 1,938  
☒ Commercial ..... Gross floor area 40,000  
☐ Industrial ..... Gross floor area \_\_\_\_\_  
☒ Other ..... Gross floor area 200 room hotel, parks, school, HOA facility

- C. ☒ Total Project acreage 1.869 Total number of lots +1900

- D. Is the project proposing the use of groundwater? ☐ Yes ☒ No  
Is the project proposing the use of reclaimed water? ☐ Yes ☒ No

Thomas Guide Page 1312 Grid B2-G2, B6  
Otay Lakes Road, North of Lower Otay Reservoir  
Project address Street  
Otay 91915  
Community Planning Area/Subregion Zip

Owner/Applicant agrees to pay all necessary construction costs, dedicate all district required easements to extend service to the project and  
COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.

Applicant's Signature: [Signature] Date: 04/05/2018

Address: 610 West Ash Suite 1500 San Diego, CA 92101 Phone: 619 515-9109

(On completion of above, present to the district that provides water protection to complete Section 2 below.)

**SECTION 2: FACILITY AVAILABILITY**

**TO BE COMPLETED BY DISTRICT**

District Name: Otay Water District Service area: ID 22

- A. ☒ Project is in the district.  
☐ Project is not in the district but is within its Sphere of Influence boundary, owner must apply for annexation.  
☐ Project is not in the district and is not within its Sphere of Influence boundary.  
☐ The project is not located entirely within the district and a potential boundary issue exists with the \_\_\_\_\_ District.
- B. ☐ Facilities to serve the project ☐ ARE ☐ ARE NOT reasonably expected to be available within the next 5 years based on the capital facility plans of the district. Explain in space below or on attached \_\_\_\_\_ (Number of sheets)  
☐ Project will not be served for the following reason(s): \_\_\_\_\_
- C. ☒ District conditions are attached. Number of sheets attached: \_\_\_\_\_  
☐ District has specific water reclamation conditions which are attached. Number of sheets attached: \_\_\_\_\_  
☐ District will submit conditions at a later date.
- D. ☐ How far will the pipeline(s) have to be extended to serve the project? \_\_\_\_\_

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature: [Signature] Print Name: Tanya Ayala-Maron  
Print Title: PERMIT TECHNICIAN Phone: 619 670-2701 Date: 5/21/18

NOTE: THIS DOCUMENT IS NOT A COMMITMENT OF SERVICE OR FACILITIES BY THE DISTRICT

On completion of Section 2 and 3 by the District, applicant is to submit this form with application to:  
Planning & Development Services - Zoning Counter, 5510 Overland Ave, Suite 110, San Diego, CA 92123



PDS-399W (Rev. 09/21/2012)

THIS APPROVAL OF AVAILABILITY IS  
SUBJECT TO ALL OTAY WATER DISTRICT  
REQUIREMENTS IN EFFECT AT THE TIME OF  
APPLICATION FOR SERVICE.

**Otay Ranch Resort Village 13**  
**County of San Diego, Planning & Development Services**  
**Project Facility Availability – Water**

**Assessor's Parcel Numbers:**

598-130-04

598-130-05

598-130-06

598-130-07

598-140-05

598-140-06

647-020-14

647-030-05

# **APPENDIX E**

## ***BehavePlus Fire Behavior Analysis***



## **APPENDIX E**

### **BehavePlus Fire Behavior Analysis**

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#### **BEHAVEPLUS FIRE BEHAVIOR MODELING**

Fire behavior modeling includes a high level of analysis and information detail to arrive at reasonably accurate representations of how wildfire would move through available fuels on a given site. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths, spread rates, and fireline intensities, the BehavePlus 5.0.5 fire behavior modeling system was applied using predominant fuel characteristics, slope percentages, and extreme weather variables for the site.

Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information.

To be used effectively, the basic assumptions and limitations of BehavePlus must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is dead fuels less than one-quarter inch in diameter. These are the fine fuels that carry fire. Fuels greater than one inch have little effect while fuels greater than three inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within six feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
- Fourth, the BehavePlus fire behavior computer modeling system was not intended for determining sufficient fuel modification zone widths. However, it does provide the average length of the flames, which is a key element for determining “defensible space” distances for minimizing structure ignition.

Although BehavePlus has some limitations, it can still provide valuable fire behavior predictions which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur on a site. The type and quantity will depend upon the soil, climate, geographic features, and the fire history of the site. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff

## APPENDIX E (Continued)

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layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

The seven fuel characteristics help define the 13 standard fire behavior fuel models (Anderson 1982) and the more recent custom fuel models developed for southern California (Weise and Regelbrugge 1997). According to the model classifications, fuel models used in BehavePlus have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface to volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in BehavePlus. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom southern California fuel models:

- Grasses Fuel Models 1 through 3
- Brush Fuel Models 4 through 7, SCAL 14 through 18
- Timber Fuel Models 8 through 10
- Logging Slash Fuel Models 11 through 13

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 new fire behavior fuel models (Scott and Burgan 2005) developed for use in BehavePlus modeling efforts. These new models attempt to improve the accuracy of the standard 13 fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the new 40 fuel models:

- Non-Burnable Models NB1, NB2, NB3, NB8, NB9
- Grass Models GR1 through GR9
- Grass-shrub Models GS1 through GS4
- Shrub Models SH1 through SH9
- Timber-understory Models TU1 through TU5
- Timber litter Models TL1 through TL9
- Slash blowdown Models SB1 through SB4

### BEHAVEPLUS FIRE BEHAVIOR MODELING INPUTS

To support the fire behavior modeling efforts conducted for this Fire Protection Plan, three fuel models were observed on the slopes to the south and east of the Project site and were subsequently used in the modeling analysis. While vegetation types other than the selected three

## APPENDIX E (Continued)

are located on site, the selected areas represent the most likely wildfire threat for the Project site. Table 1 provides a description of the three fuel models:

**Table 1**  
**Fuel Model Characteristics**

Fuel Model	Description	Tons/acre; Btu/lb.	Fuel Bed Depth (feet)
GS2	Moderate load, dry climate grass/shrub	2.6 tons/acre; 8,000 Btu/lb.	1.5
SCAL15	Chamise	10 tons/acre; 10,000 Btu/lb.	3.0
SH7	Very high load dry scrub	14 tons/acre; 8,000 Btu/lb.	6.0

Weather values for the modeling runs incorporated two different scenarios: a summer fire and a fall/early winter fire. Weather data was derived from the San Miguel Remote Automated Weather Station (RAWS), and the National Weather Service station in Chula Vista, California. Additionally, 50 mph wind speed values were utilized to represent catastrophic fire weather conditions as observed during the 2003 Cedar Fire. Slope values for this site were measured from site topographic maps and are presented in units of percent. The modeling runs utilized worst-case (steepest) slope values in areas adjacent to proposed development areas with measurements ranging from flat (0%) to 44%. The fire behavior modeling input variables for the Project site are presented in Table 2.

**Table 2**  
**BehavePlus Fire Behavior Modeling Inputs**

Variable	Summer	Fall/Early Winter
Month	September	October
Temperature	89 °F	92 °F
Relative Humidity	14 %	12 %
1-hour Fuel Moisture	3 %	2 %
Live Fuel Moisture	70 %	55 %
Wind Speed	20 mph from SW	24 mph from NE/50 mph from NE
Slope	44 % (worst case)	0 %

## BEHAVEPLUS FIRE BEHAVIOR MODELING RESULTS

Four fire behavior variables were selected as outputs from the BehavePlus analysis conducted for the project site, and include flame length (feet), rate of spread (mph), spotting distance (miles), and ignition probability (percentage). The aforementioned fire behavior variables are an important component in understanding fire risk and fire agency response capabilities. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews,

## APPENDIX E (Continued)

Bevins, and Seli 2004). It is a somewhat subjective and non-scientific measure of fire behavior, but is extremely important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1983). Fireline intensity is a measure of heat output from the flaming front, and also affects the potential for a surface fire to transition to a crown fire. Fire spread rate represents the speed at which the fire progresses through surface fuels and is another important variable in initial attack and fire suppression efforts. The information in Table 3 presents an interpretation of these fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Table 4.

**Table 3**  
**Fire Suppression Interpretation**

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems -- torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

**Source:** BehavePlus 5.0.5 fire behavior modeling program (Andrews, Bevins, and Seli 2004)

**Table 4**  
**BehavePlus Fire Behavior Modeling Results**

Fuel Model	BehavePlus Output	Summer Fire	Fall Fire	Extreme Fall Fire
GS2	Surface Rate of Spread	0.7 mph	1.2 mph	—
	Flame Length	8.0 feet	11.0 feet	15.0 feet
	Spot Distance from Wind Driven Surface Fire	0.4 miles	0.6 miles	—
	Ignition Probability	89%	100%	—
SCAL15	Surface Rate of Spread	0.6 mph	1.1 mph	—
	Flame Length	14.0 feet	18.0 feet	20.0 feet
	Spot Distance from Wind Driven Surface Fire	0.6 miles	0.8 miles	—
	Ignition Probability	89%	100%	—
SH7	Surface Rate of Spread	1.1 mph	2.3 mph	—
	Flame Length	21 feet	31 feet	46.0 feet
	Spot Distance from Wind Driven Surface Fire	0.6 miles	1.1 miles	2.5 miles
	Ignition Probability	89%	100%	—



## APPENDIX E (Continued)

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### REFERENCES

- Anderson, Hal E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service Gen. Tech. Report INT-122. Intermountain Forest and Range Experiment Station, Ogden, Utah.
- Andrews, Patricia L., Collin D. Bevins, and Robert C. Seli. 2004. BehavePlus fire modeling system, version 3.0: User's Guide. Gen. Tech. Rep. RMRS-GTR-106 Ogden, Utah: Department of Agriculture, Forest Service, Rocky Mountain Research Station. 132p.
- Rothermel, R.C. 1983. How to Predict the Spread and Intensity of Forest and Range Fires. USDA Forest Service Gen. Tech. Report INT-143. Intermountain Forest and Range Experiment, Ogden, Utah.
- Scott, Joe H. and Robert E. Burgan. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.
- Weise, D.R. and J. Regelbrugge. 1997. Recent chaparral fuel modeling efforts. Prescribed Fire and Effects Research Unit, Riverside Fire Laboratory, Pacific Southwest Research Station. 5p.

## APPENDIX E (Continued)

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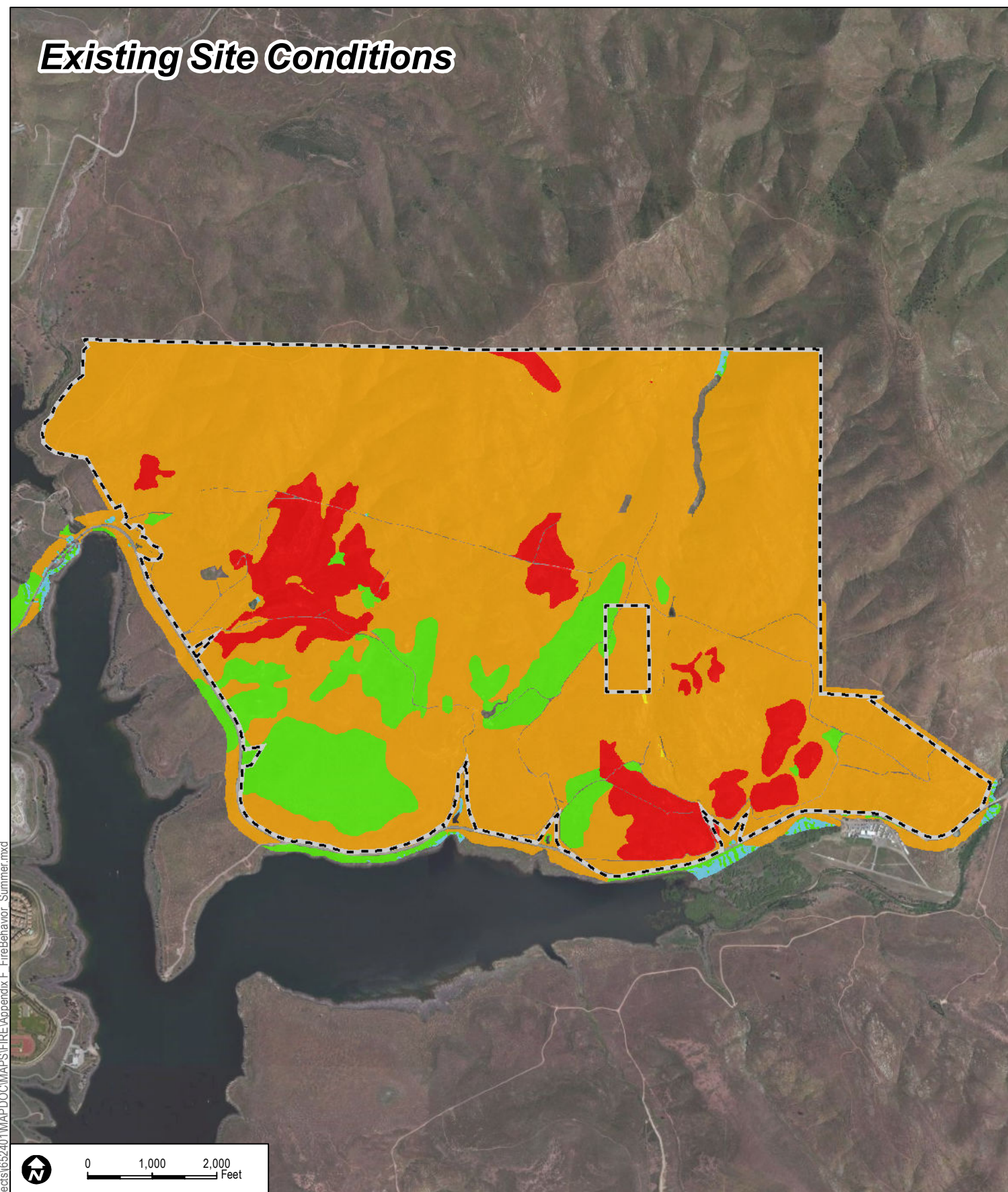
# **APPENDIX F**

*FlamMap Current and Post Development –  
Summer Fire*





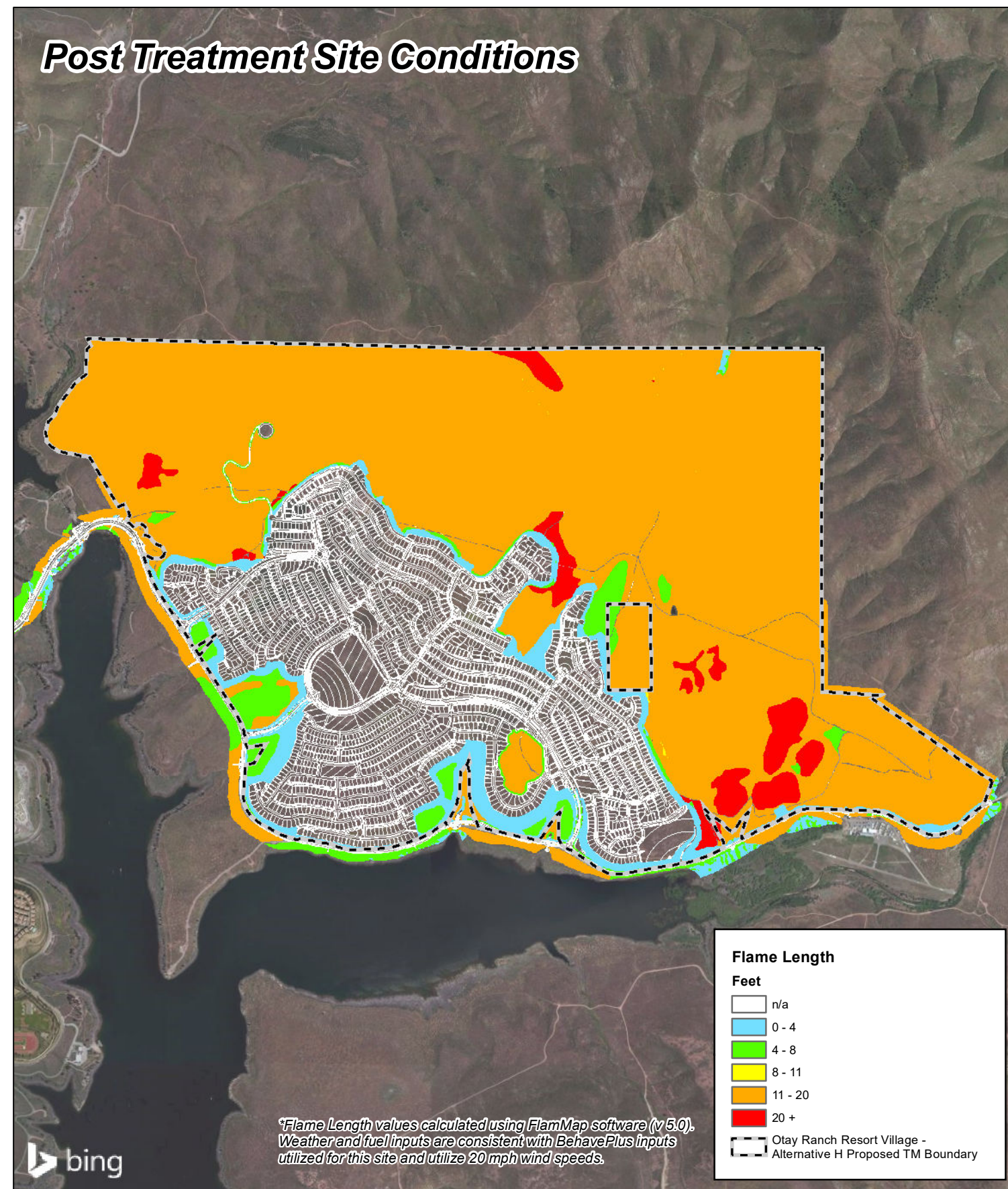
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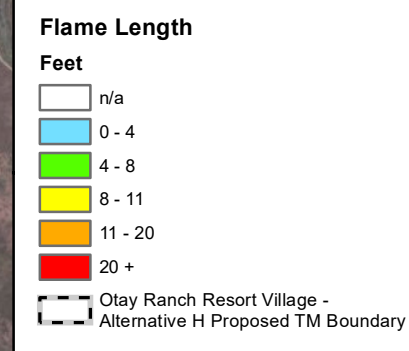
SOURCE: SANGIS 2016; BING 2016; Hunsaker 2018

**DUDEK**

## Post Treatment Site Conditions



\*Flame Length values calculated using FlamMap software (v 5.0).  
Weather and fuel inputs are consistent with BehavePlus inputs  
utilized for this site and utilize 20 mph wind speeds.



## APPENDIX F

## Fire Behavior Analysis - Summer Fire

Otay Ranch Resort Village □ Alternative H Fire Protection Plan



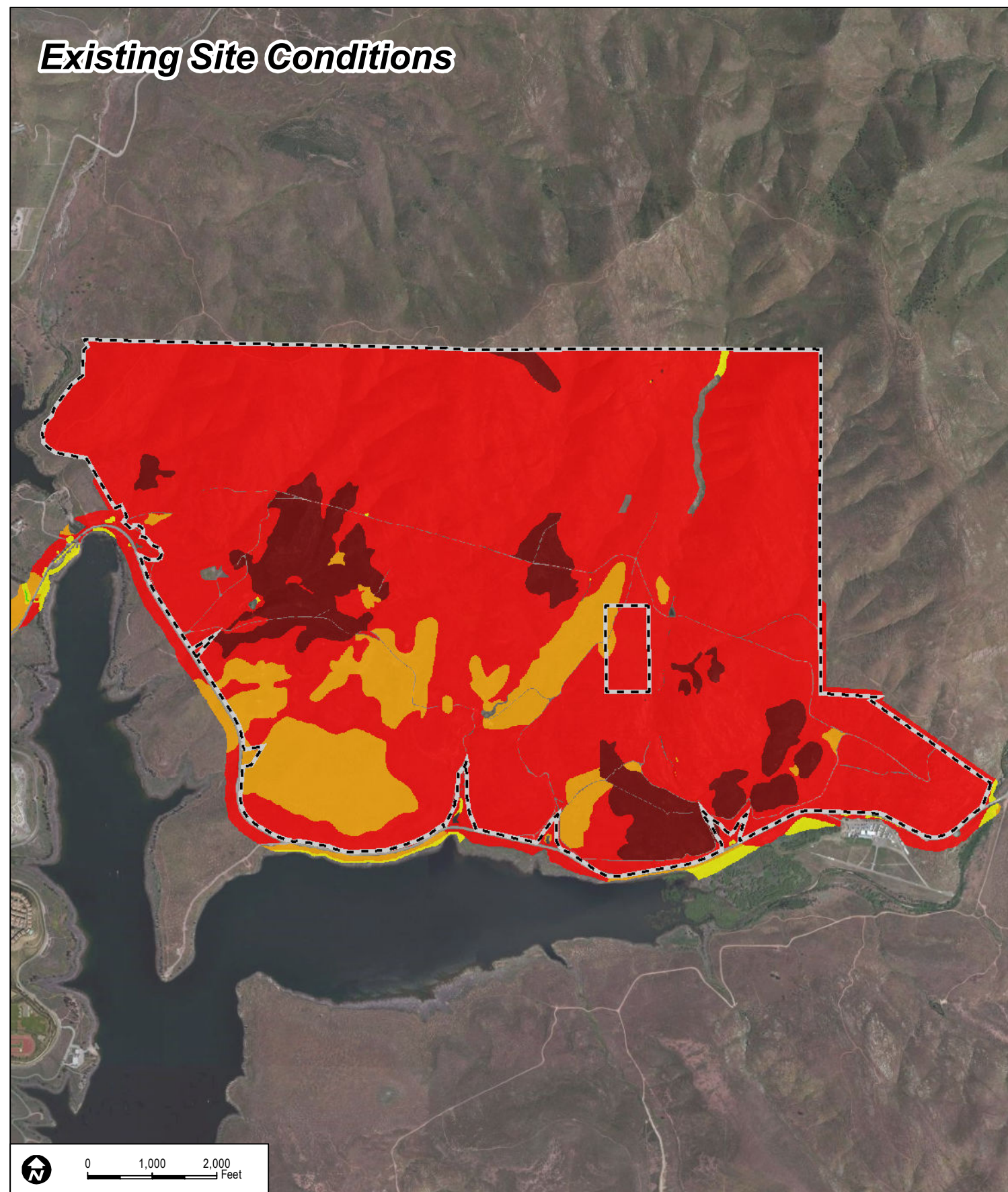
# **APPENDIX G**

***FlamMap Current and Post Development –  
Fall Fire***

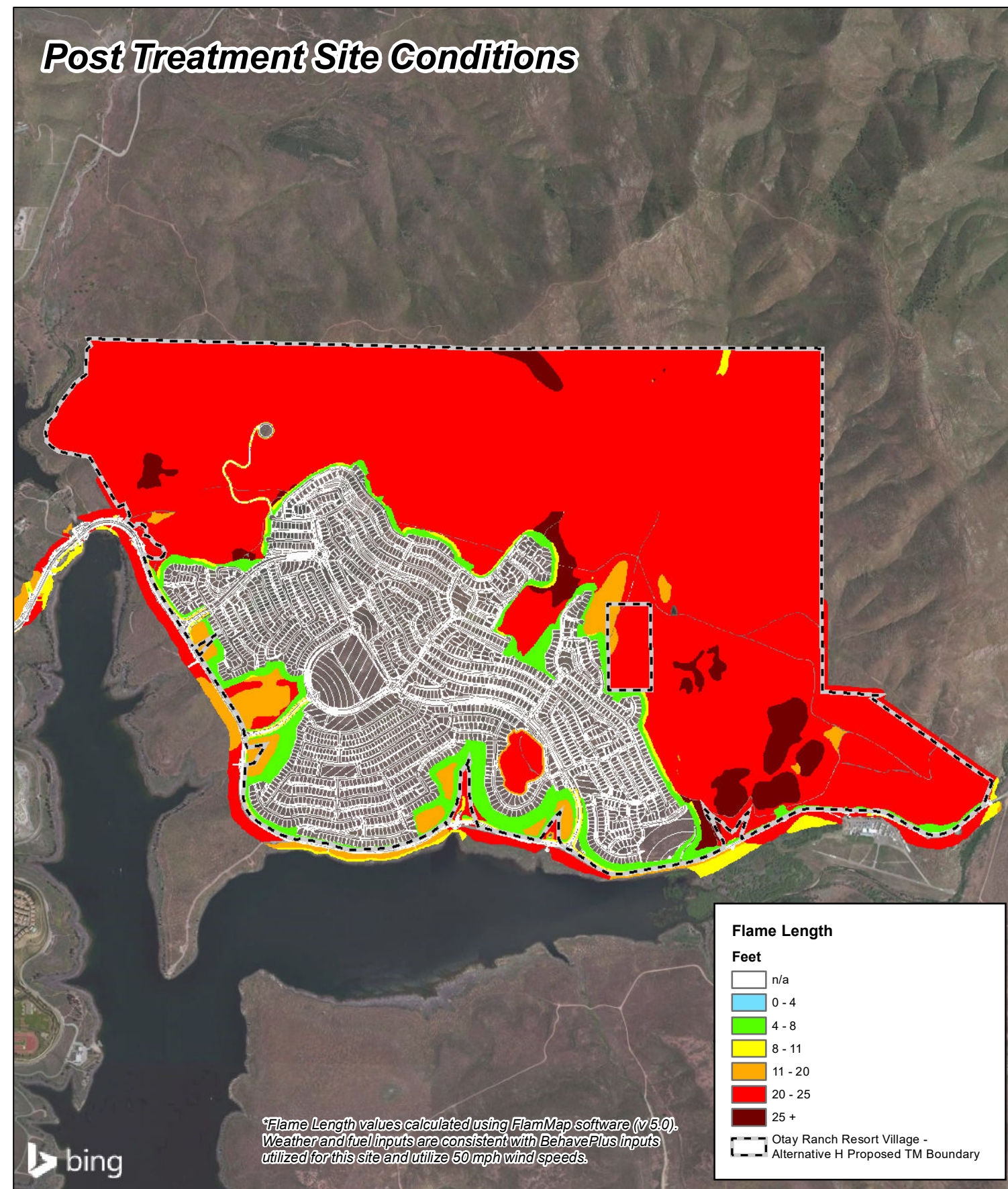




## Existing Site Conditions



## Post Treatment Site Conditions



SOURCE: SANGIS 2016; BING 2016; Hunsaker 2018

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APPENDIX G

Fire Behavior Analysis - Fall Fire

Otay Ranch Resort Village □ Alternative H Fire Protection Plan

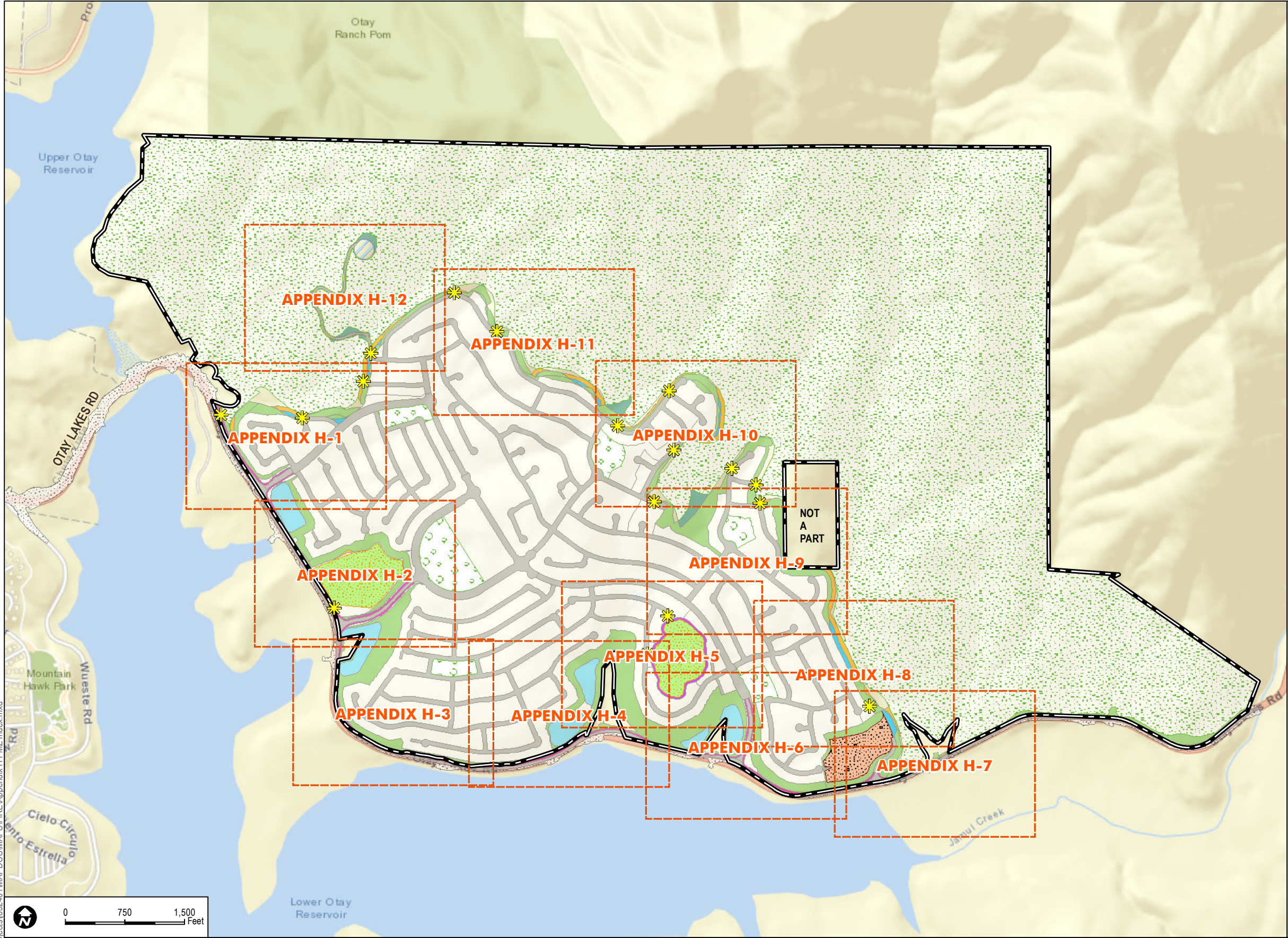




















# **APPENDIX H**

## ***Fuel Modification Plan***

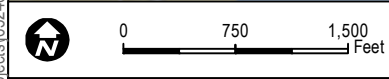






-  Project Site
- FMZ & LAND USES**
-  Zone A (irrigated)
  -  Zone B (thinning)
  -  10' Roadside FMZ
  -  20' Roadside FMZ
  -  30' FMZ within Open Space Lot E
  -  Manufactured Slope
  -  Preserve Revegetation Slopes
  -  Basin
  -  Water Tank
  -  Conservation OS
  -  Park
  -  Resort
  -  Development
  -  Offsite Roadway
  -  Roadway
  -  Preserve
  -  FMZ Access Point

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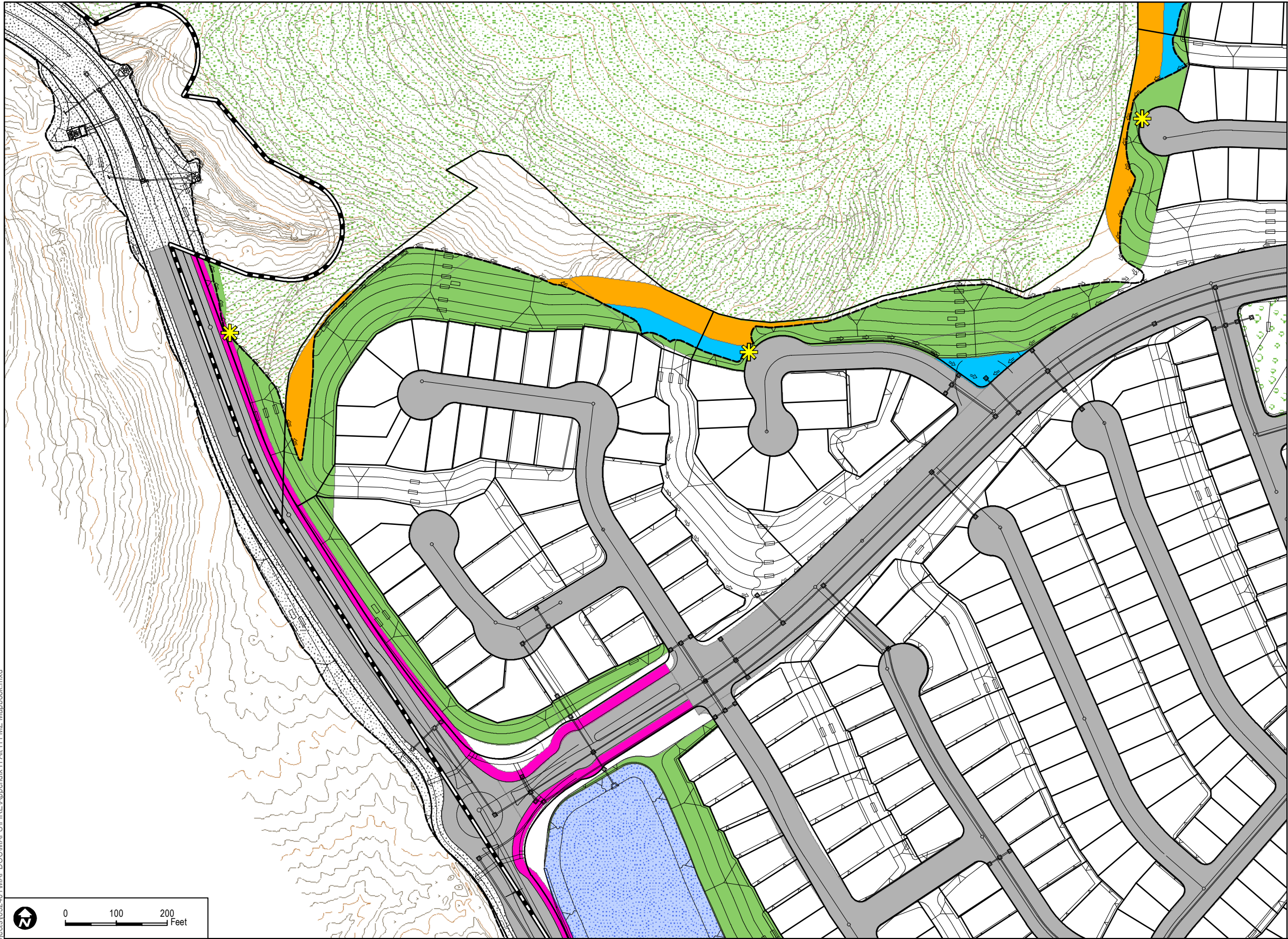
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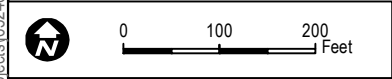
**APPENDIX H**  
**Fuel Modification Plan Index Map**

Otay Ranch Resort Village □ Alternative H Fire Protection Plan





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
- Zone B (thinning)
- 10' Roadside FMZ
- 20' Roadside FMZ
- 30' FMZ within Open Space Lot E
- Manufactured Slope
- Preserve Reveg Slopes
- Basin
- Water Tank
- Conservation OS
- Park
- Resort
- Development
- Offsite Roadway
- Roadway
- Preserve
- 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
- FMZ Access

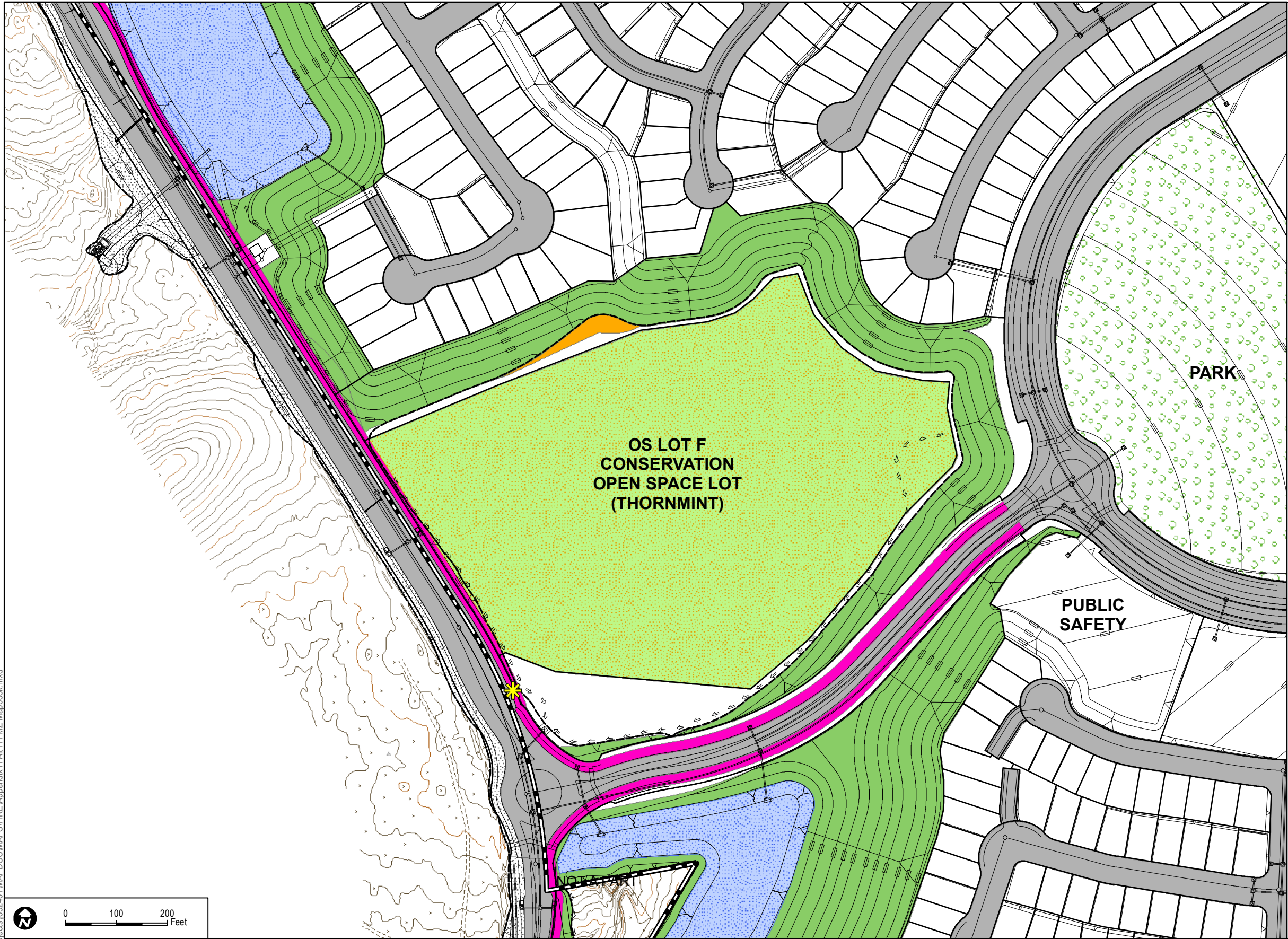


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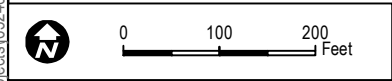
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APPENDIX H-1  
Fuel Modification Plan





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
- Zone B (thinning)
- 10' Roadside FMZ
- 20' Roadside FMZ
- 30' FMZ within Open Space Lot E
- Manufactured Slope
- Preserve Reveg Slopes
- Basin
- Water Tank
- Conservation OS
- Park
- Resort
- Development
- Offsite Roadway
- Roadway
- Preserve
- 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
- FMZ Access



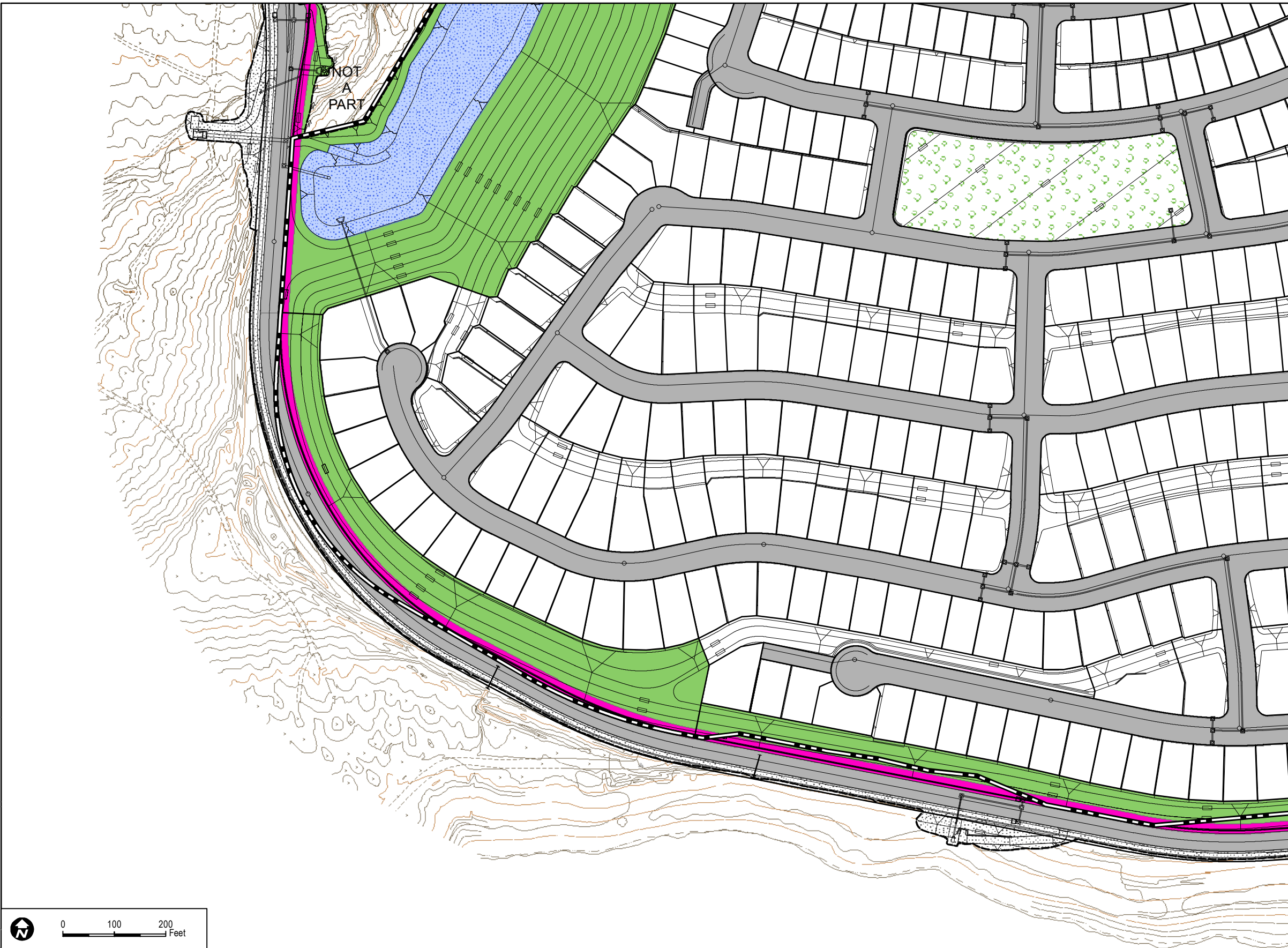
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**APPENDIX H-2**  
**Fuel Modification Plan**



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Project Site

#### FMZ & LAND USES

Zone A (irrigated)

Zone B (thinning)

10' Roadside FMZ

20' Roadside FMZ

30' FMZ within Open Space Lot E

Manufactured Slope

Preserve Revegetation Slopes

Basin

Water Tank

Conservation OS

Park

Resort

Development

Offsite Roadway

Roadway

Preserve

6-Ft Masonry or Fire View Wall  
abutting Vernal Pool Preserve

FMZ Access



0 100 200  
Feet

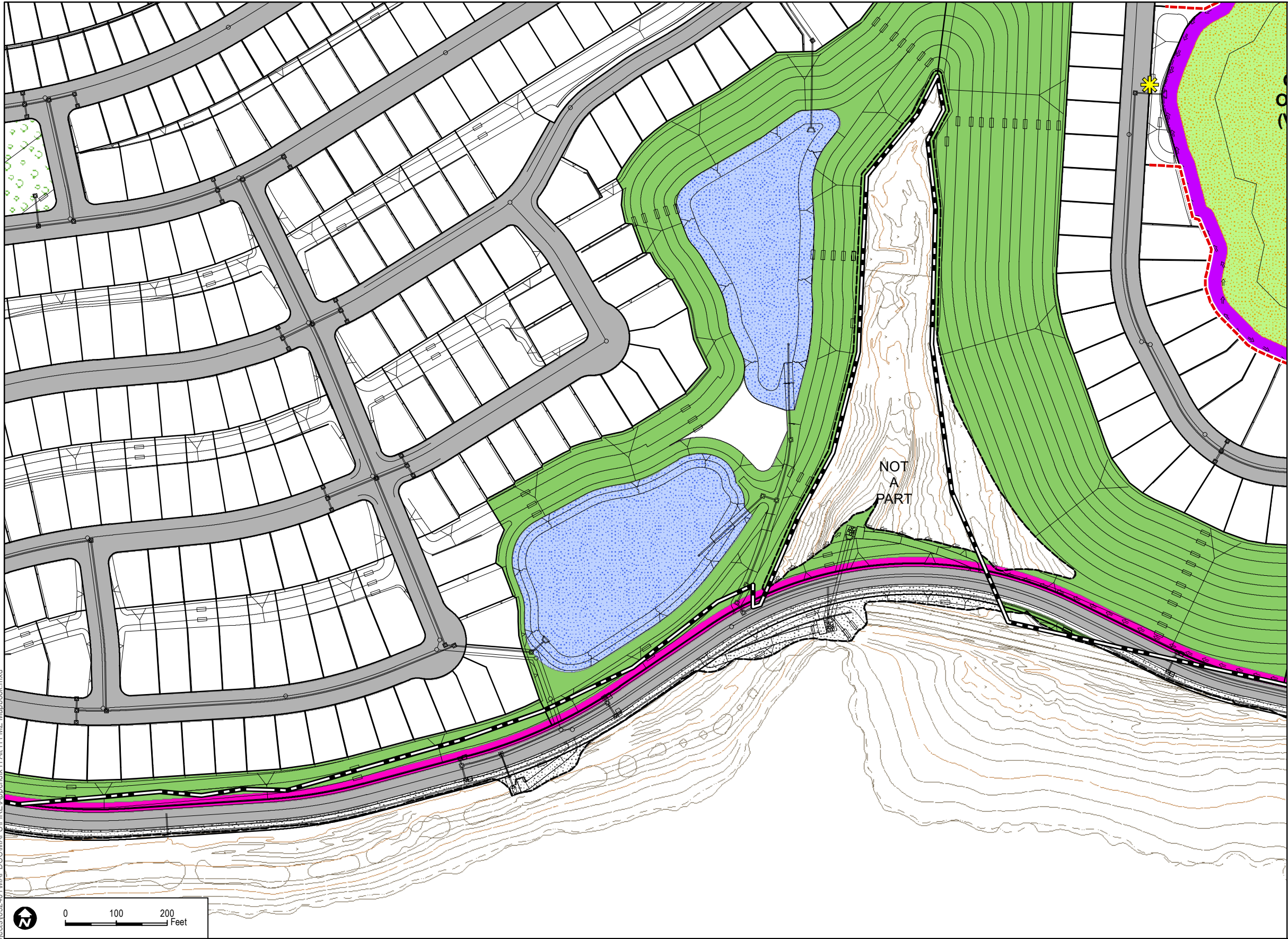
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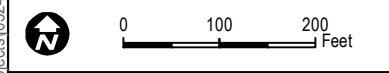
#### APPENDIX H-3 Fuel Modification Plan

Otay Ranch Resort Village □ Alternative H Fire Protection Plan





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
  - Zone B (thinning)
  - 10' Roadside FMZ
  - 20' Roadside FMZ
  - 30' FMZ within Open Space Lot E
  - Manufactured Slope
  - Preserve Reveg Slopes
  - Basin
  - Water Tank
  - Conservation OS
  - Park
  - Resort
  - Development
  - Offsite Roadway
  - Roadway
  - Preserve
  - 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  - FMZ Access






















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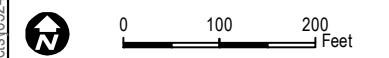
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**Fuel Modification Plan**





-  Project Site
- FMZ & LAND USES**
-  Zone A (irrigated)
  -  Zone B (thinning)
  -  10' Roadside FMZ
  -  20' Roadside FMZ
  -  30' FMZ within Open Space Lot E
  -  Manufactured Slope
  -  Preserve Reveg Slopes
  -  Basin
  -  Water Tank
  -  Conservation OS
  -  Park
  -  Resort
  -  Development
  -  Offsite Roadway
  -  Roadway
  -  Preserve
  -  6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  -  FMZ Access

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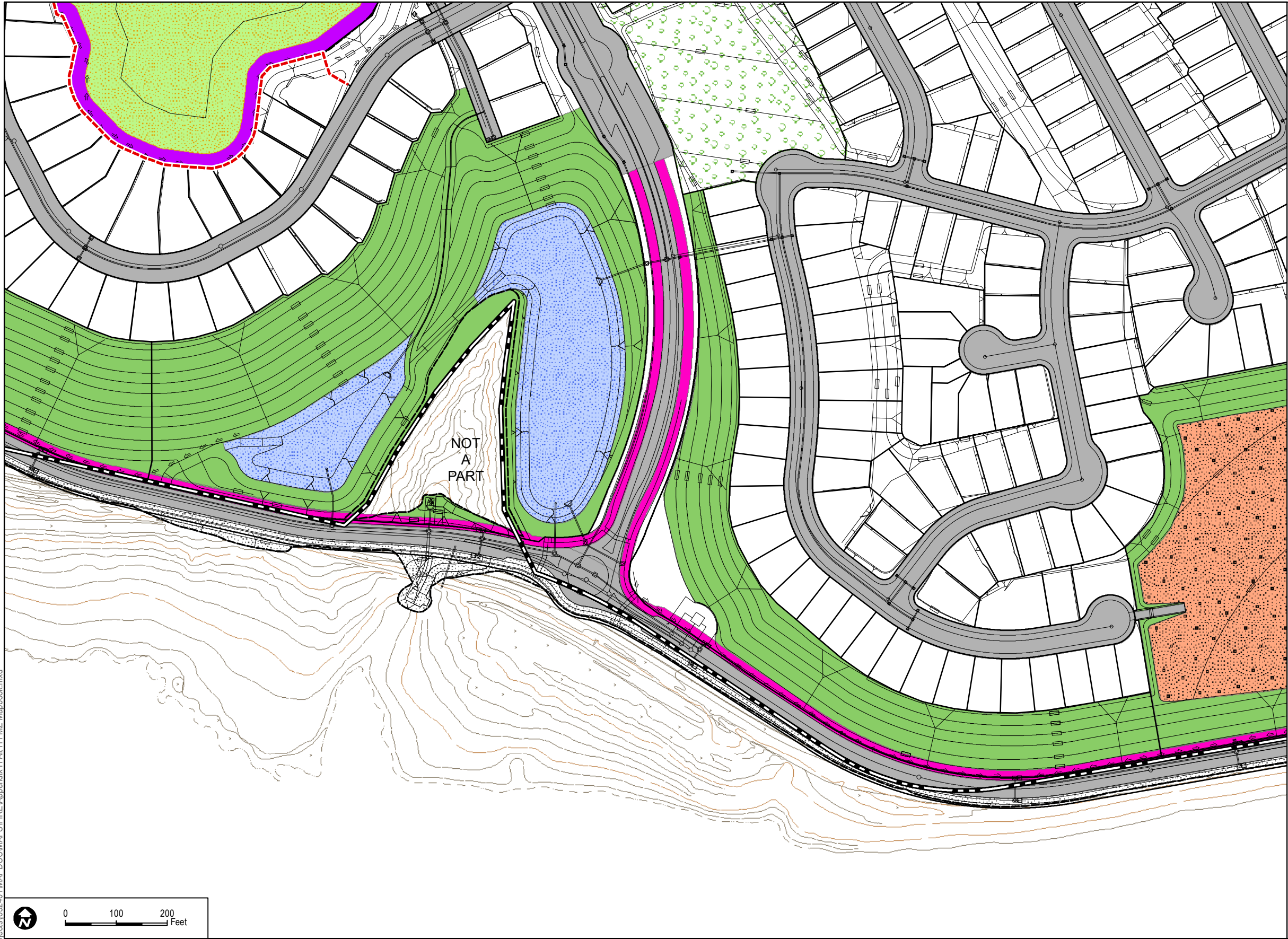


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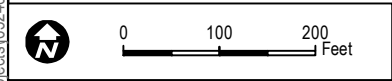
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**APPENDIX H-5**  
**Fuel Modification Plan**





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
- Zone B (thinning)
- 10' Roadside FMZ
- 20' Roadside FMZ
- 30' FMZ within Open Space Lot E
- Manufactured Slope
- Preserve Reveg Slopes
- Basin
- Water Tank
- Conservation OS
- Park
- Resort
- Development
- Offsite Roadway
- Roadway
- Preserve
- 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
- FMZ Access

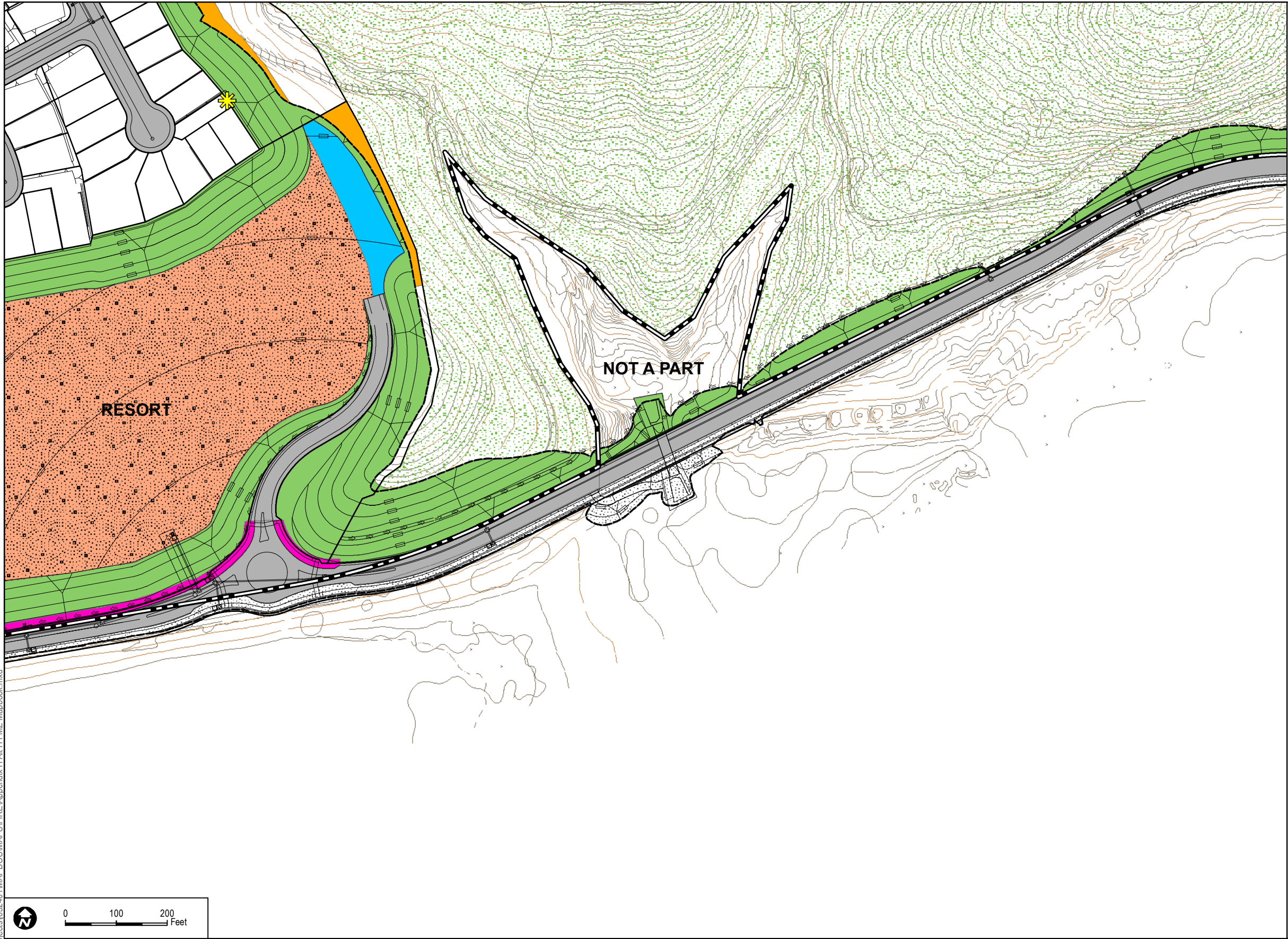


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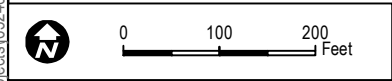
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**APPENDIX H-6**  
**Fuel Modification Plan**





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
- Zone B (thinning)
- 10' Roadside FMZ
- 20' Roadside FMZ
- 30' FMZ within Open Space Lot E
- Manufactured Slope
- Preserve Reveg Slopes
- Basin
- Water Tank
- Conservation OS
- Park
- Resort
- Development
- Offsite Roadway
- Roadway
- Preserve
- 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
- FMZ Access



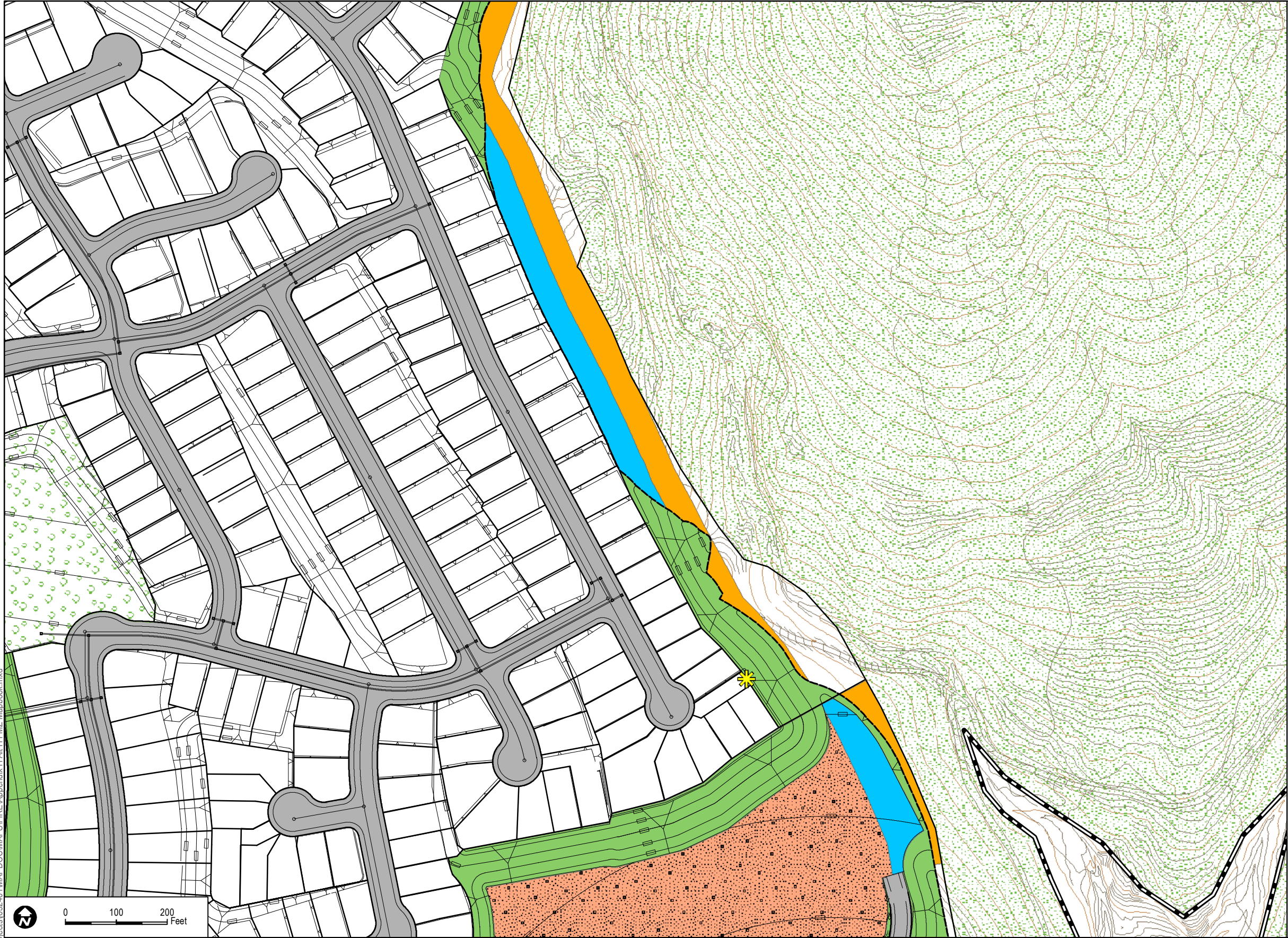
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APPENDIX H-7  
Fuel Modification Plan

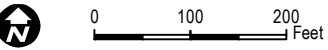
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- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
  - Zone B (thinning)
  - 10' Roadside FMZ
  - 20' Roadside FMZ
  - 30' FMZ within Open Space Lot E
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  - Water Tank
  - Conservation OS
  - Park
  - Resort
  - Development
  - Offsite Roadway
  - Roadway
  - Preserve
  - 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  - FMZ Access

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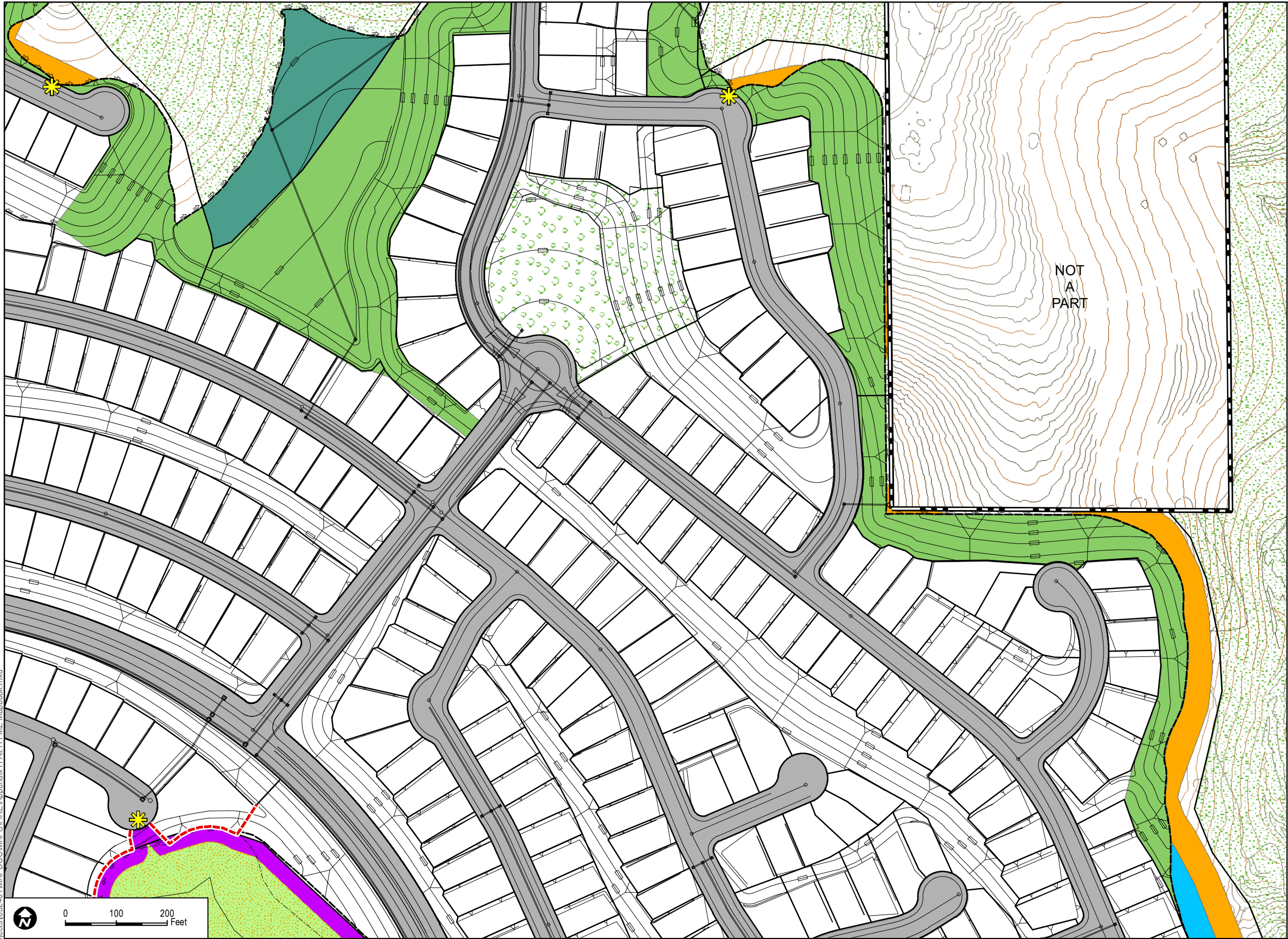


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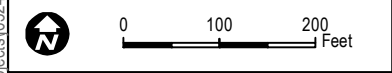
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**APPENDIX H-8**  
**Fuel Modification Plan**





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
  - Zone B (thinning)
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  - Resort
  - Development
  - Offsite Roadway
  - Roadway
  - Preserve
  - 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  - FMZ Access

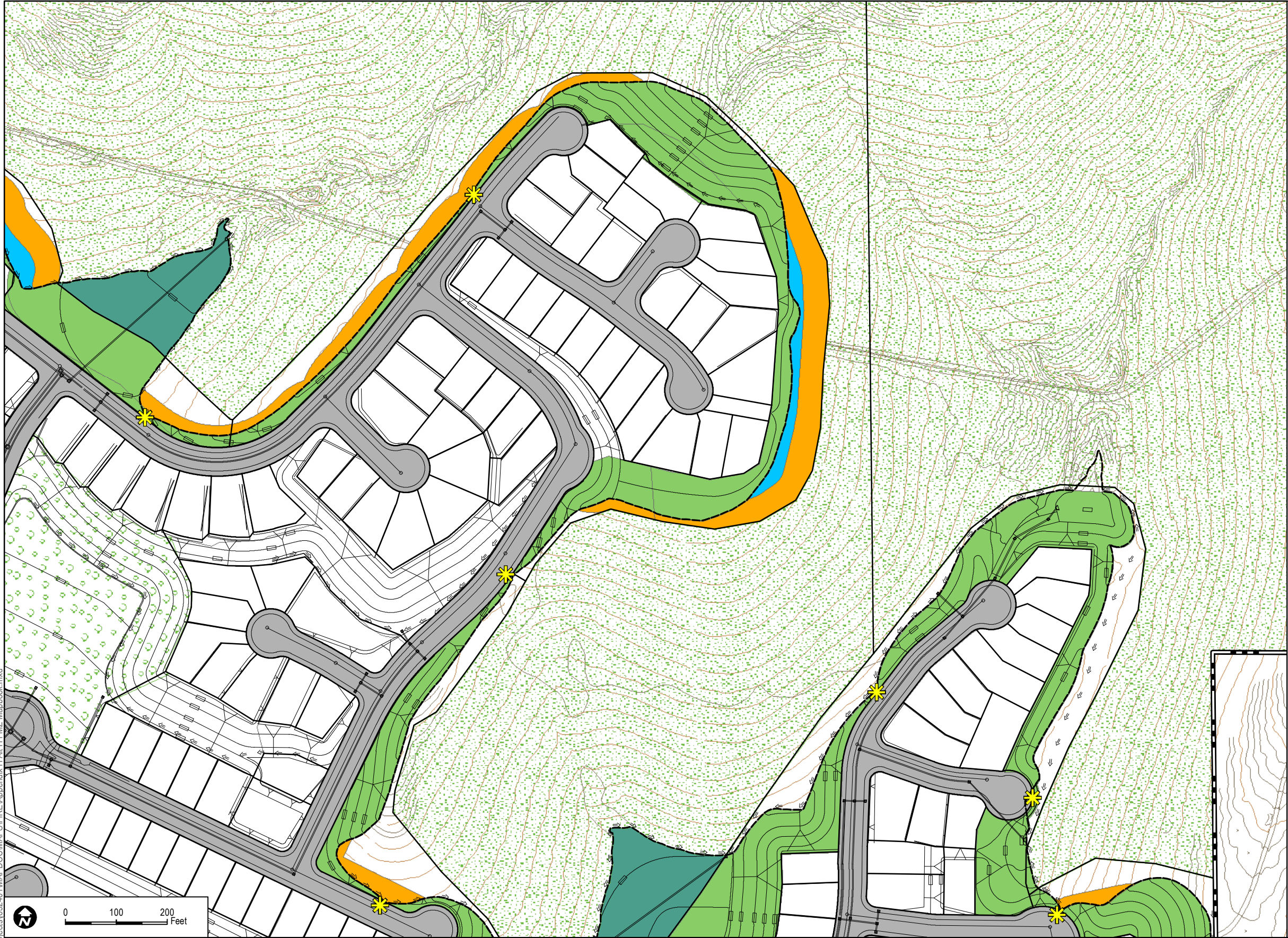


SOURCE: ESRI 2016; Hunsaker 2018

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**APPENDIX H-9**  
**Fuel Modification Plan**





- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
  - Zone B (thinning)
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  - Roadway
  - Preserve
  - 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  - FMZ Access

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SOURCE: ESRI 2016; Hunsaker 2018

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Project Site

**FMZ & LAND USES**

Zone A (irrigated)

Zone B (thinning)

10' Roadside FMZ

20' Roadside FMZ

30' FMZ within Open Space Lot E

Manufactured Slope

Preserve Reveget Slopes

Basin

Water Tank

Conservation OS

Park

Resort

Development

Offsite Roadway

Roadway

Preserve

6-Ft Masonry or Fire View Wall  
abutting Vernal Pool Preserve

FMZ Access

SOURCE: ESRI 2016; Hunsaker 2018

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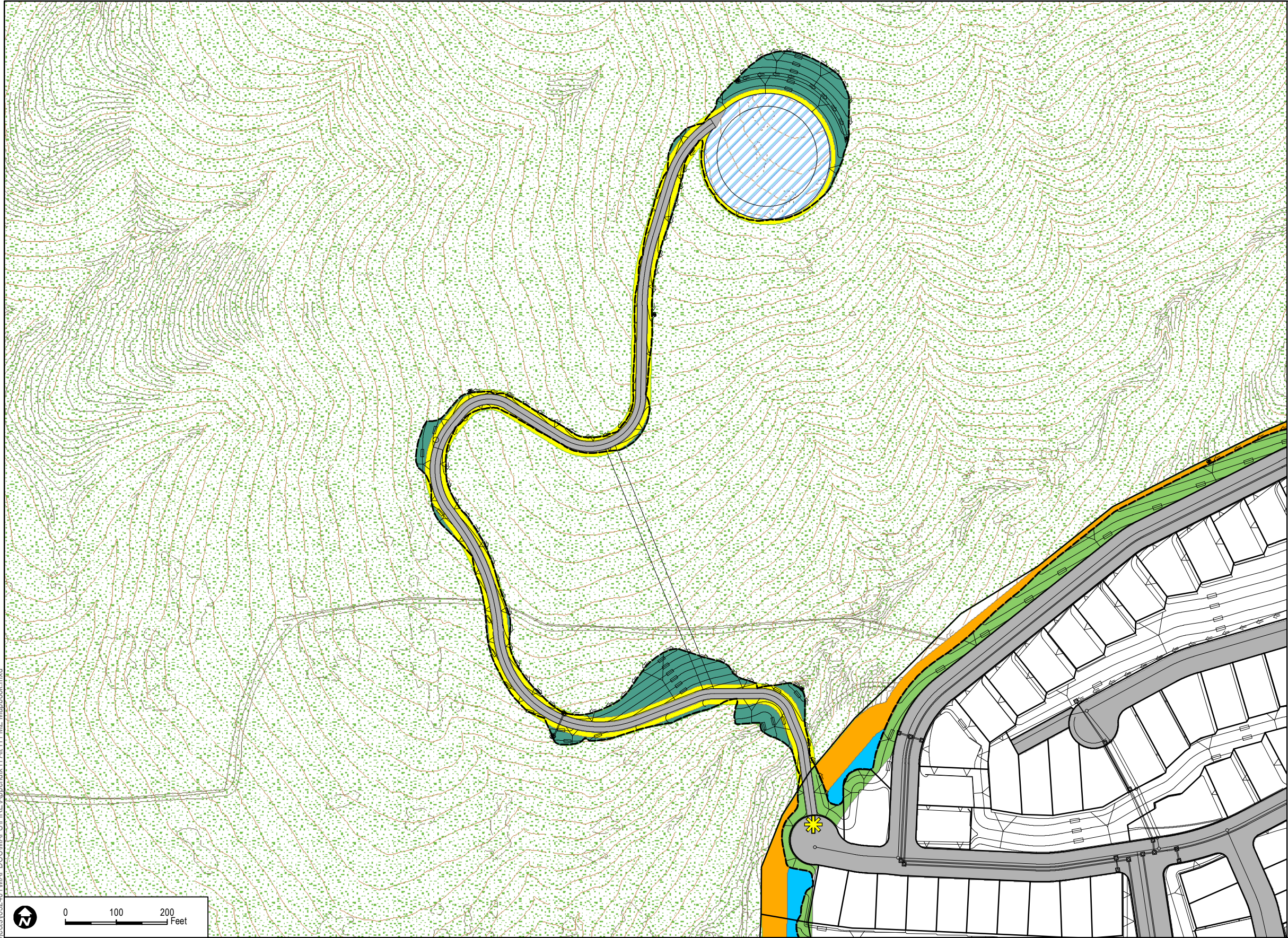
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**Fuel Modification Plan**

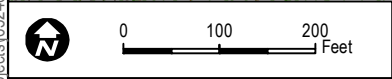
Otay Ranch Resort Village □ Alternative H Fire Protection Plan

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- Project Site
- FMZ & LAND USES**
- Zone A (irrigated)
  - Zone B (thinning)
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  - Resort
  - Development
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  - Roadway
  - Preserve
  - 6-Ft Masonry or Fire View Wall abutting Vernal Pool Preserve
  - FMZ Access



SOURCE: ESRI 2016; Hunsaker 2018

DUDEK





# **APPENDIX I**

## *Alternative H Plant List*





---

## Landscape Palette

### Area #1: Scenic Highway – Otay Lakes Road

#### Trees such as, but not limited to:

Arbutus unedo*	Strawberry Tree	Kc 0.3
Cercis occidentalis	Western Redbud	Kc 0.3
Platanus racemosa	California Sycamore	Kc 0.5
Quercus agrifolia*	Coast Live	Kc 0.3
Quercus suber*	Cork Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3

#### Shrubs & Groundcovers such as, but not limited to:

Agave attenuata*	Century Plant	Kc 0.3
Agave shawii*	Coastal Agave	Kc 0.3
Baccharis pilularis 'Twin Peaks'	Dwarf Coyote Bush	Kc 0.3
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Dalea orcuttii	Baja Indigo Bush	Kc 0.3
Cotoneaster dammeri Lowfast	Bearberry Cotoneaster	Kc 0.5
Eriophyllum confertiflorum*	Golden Yarrow	Kc 0.1
Limonium perezii	Sea Lavender	Kc 0.3
Mimulus auranticus*	Monkey Flower	Kc 0.3
Muhlenbergia caillaris	Pink Wisp Grass	Kc 0.5
Nassella pulchra	Purple Needle Grass	Kc 0.1
Salvia sonomensis	Creeping Sage	Kc 0.3
Yucca schidigera*	Mojave Yucca	Kc 0.3
Yucca whipplei*	Foothill Yucca	Kc 0.3

#### Perimeter Slope Hydroseed Mix:

Camissonia cheiranthifolia	Beach Primrose	Kc 0.3
Encelia californica	Coast Sunflower	Kc 0.1
Eschscholzia californica*	California Poppy	Kc 0.3
Isocoma menziesii	Goldenbush	Kc 0.1
Heliathemum scoparium	Rush Rose	n/a
Lastheria californica	California Goldfields	n/a
Lotus scoparius*	Deerweed	Kc 0.1
Lupinus nanus	Dwarf Lupine	n/a
Nassella pulchra	Purple Needle Grass	Kc 0.1

#### Drainage Basin Hydroseed Mix:

Artemisia douglasiana	Mugwort	Kc 0.3
Isocoma menziesii	Goldenbush	Kc 0.1
Iva hayesiana*	San Diego Marsh Elder	Kc 0.3
Sisyrinchium bellum	Blue Eyed Grass	Kc 0.3

---

## Area #2: Village Entries

### Trees such as, but not limited to:

Erythrina caffra*	Coral Tree	Kc 0.3
-------------------	------------	--------

### Shrubs & Groundcovers such as, but not limited to:

Agapanthus Rancho White	White Lily-of-the-Nile	Kc 0.5
Agave attenuata	Century Plant	Kc 0.3
Aloe species	Aloe	Kc 0.3
Bougainvillea species	Bougainvillea	Kc 0.3
Callistemon citrinus Compacta	Dwarf Lemon Bottlebrush	Kc 0.3
Carissa macrocarpa 'Green Carpet'	Prostrate Natal Plum	Kc 0.5
Dianella species	Flax Lily	Kc.0.5
Echium fastuosum	Pride of Madeira	Kc 0.3
Hesperaloe parviflora	Red Yucca	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Ligustrum japonicum 'Texanum**	Japanese Privet	Kc 0.5
Limonium perezii	Sea Lavender	Kc 0.3
Phormium species	Flax	Kc 0.5
Rhaphiolepis indica*	India Hawthorn	Kc 0.5
Senecio mandraliscae	Kleinia	Kc 0.3

### Grasses (Parkway planting) such as, but not limited to:

Carex species	Sedge	Kc 0.5
Dianella species	Flax Lily	Kc 0.5
Nassella pulchra	Purple Needle Grass	Kc 0.1

## Area #3: Village Interior Parkways, Streets, Alleys & Traffic Circles

### Trees such as, but not limited to:

Agonis flexuosa	Peppermint Tree	Kc 0.5
Arbutus 'Marina'	Marina Arbutus	Kc 0.5
Brachychiton populneus	Bottle Tree	Kc 0.3
Geijera parviflora	Australian Willow	Kc 0.5
Koelreuteria bipinnata	Chinese Flame Tree	Kc 0.5
Lagerstromia inidica	Crape Myrtle	Kc 0.5
Laurus nobils 'Saratoga'	Saratoga Sweet Bay	Kc 0.3
Metrosideros exelsus	New Zealand Christmas Tree	Kc 0.5
Olea europea Wilsoni	Fruitless Olive Tree	Kc 0.3
Quercus agrifolia*	Coast Live	Kc 0.3
Quercus ilex	Holly Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3
Tipuana tipu	Tipu Trees	Kc 0.5
Tristania conferta*	Brisbane box	Kc 0.5

### Shrubs & Groundcovers such as, but not limited to:

Agapanthus Rancho White	White Lily-of-the-Nile	Kc 0.5
Aloe species	Aloe	Kc 0.3
Bougainvillea species	Bougainvillea	Kc 0.3
Buxus microphylla 'Green Beauty'	Dwarf Boxwood	Kc 0.5
Callistemon citrinus Compacta	Dwarf Lemon Bottlebrush	Kc 0.3
Carissa macrocarpa Green Carpet*	Prostrate Natal Plum	Kc 0.5
Echium fastuosum	Pride of Madeira	Kc 0.3
Hesperaloe parviflora	Red Yucca	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Ligustrum japonicum 'Texanum**	Japanese Privet	Kc 0.5

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Limonium perezii	Sea Lavender	Kc 0.3
Mimulus auranticus*	Monkey Flower	Kc 0.3
Phormium species	Flax	Kc 0.5
Rhaphiolepis indica*	India Hawthorn	Kc 0.5
Senecio mandraliscae	Kleinia	Kc 0.3
Strelitzia nicotia	Giant Bird of Paradise	Kc 0.5
Strelitzia reginae	Bird of Paradise	Kc 0.5
Trachelospermum jasminoides	Star Jasmine	Kc 0.5

**Grasses (Parkway planting) such as, but not limited to:**

Paspalum vaginatum 'Aloha'	Seashore Paspalum	Kc 0.5
Dianella species.	Flax Lily	Kc 0.5
Carex species.	Sedge	Kc 0.5
Nassella pulchra	Purple Needle Grass	Kc 0.1

**Area #4: Commercial, Multi-Family, Schools & Single Family Residential Lots**

**Trees such as, but not limited to:**

Agonis flexuosa	Peppermint Tree	Kc 0.5
Arbutus 'Marina'	Marina Arbutus	Kc 0.5
Brachychiton populneus	Bottle Tree	Kc 0.3
Geijera parviflora	Australian Willow	Kc 0.5
Koelreuteria bipinnata	Chinese Flame Tree	Kc 0.5
Lagerstromia inidica	Crape Myrtle	Kc. 0.5
Laurus nobilis 'Saratoga'	Saratoga Sweet Bay	Kc 0.3
Metrosideros exelsus	New Zealand Christmas Tree	Kc 0.5
Olea europea Wilsoni	Fruitless Olive Tree	Kc 0.3
Quercus ilex	Holly Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3
Tristania conferta*	Brisbane box	Kc 0.5

**Shrubs & Groundcovers such as, but not limited to:**

Agapanthus Rancho White	White Lily-of-the-Nile	Kc 0.5
Agapanthus africanus	Lily-of-the-Nile	Kc 0.5
Agave attenuata	Century Plant	Kc 0.3
Aloe species*	Aloe	Kc 0.3
Bougainvillea species	Bougainvillea	Kc 0.3
Buxus microphylla 'Green Beauty'	Dwarf Boxwood	Kc 0.5
Callistemon citrinus Compacta	Dwarf Lemon Bottlebrush	Kc 0.3
Carissa macrocarpa Green Carpet*	Prostrate Natal Plum	Kc 0.5
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Cotoneaster dammeri Lowfast*	Bearberry Cotoneaster	Kc 0.5
Dietes bicolor*	Fortnight Lily	Kc 0.5
Disctus Rivers	Royal Trumpet Vine	Kc 0.5
Distictus buccinatoria	Blood-Red Trumpet Vine	Kc 0.5
Echium fastuosum	Pride of Madeira	Kc 0.3
Euryops pectinatus	Shrub Daisy	Kc 0.3
Heteromeles arbutifolia*	Toyon	Kc 0.3
Hesperaloe parviflora	Red Yucca	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Lavendula species*	Lavender	Kc 0.3
Ligustrum japonicum 'Texanum'	Texas Privet	Kc 0.5
Limonium perezii	Sea Lavender	Kc 0.3
Marathon 2e	Dwarf Tall Fescue (See Note #3)	Kc 0.8
Mimulus auranticus*	Monkey Flower	Kc 0.3
Myrtus species	Myrtle	Kc 0.5

Nandina domestica	Heavenly Bamboo	Kc 0.5
Phormium species	Flax	Kc 0.5
Pittosporum tobira	Common Tobira	Kc 0.5
Pittosporum tobira Wheelers Dwarf*	Dwarf Tobira	Kc 0.5
Rosa species	Rose	Kc 0.5
Senecio mandraliscae	Kleinia	Kc 0.3
Strelitzia nicotia	Giant Bird of Paradise	Kc 0.5
Strelitzia reginae	Bird of Paradise	Kc 0.5
Trachelospermum jasminoides	Star Jasmine	Kc 0.5
Verbena species	Verbena	Kc 0.5
Wisteria sinensis	Chinese Wisteria	Kc 0.5
Xyosma congestum	Shiny Xylosma	Kc 0.5

**Grasses (Parkway planting) such as, but not limited to:**

Paspalum vaginatum 'Aloha'	Seashore Paspalum	Kc 0.5
Dianella species.	Flax Lily	Kc 0.5
Carex species.	Sedge	Kc 0.5
Festuca glauca	Blue Fescue	Kc 0.3
Nassella pulchra	Purple Needle Grass	Kc 0.1

**Area #5: The Resort**

**Trees such as, but not limited to:**

Arbutus 'Marina'	Marina Arbutus	Kc 0.5
Brachychiton populneus	Bottle Tree	Kc 0.3
Cupressus sempervirens Strica	Italian Cypress (See note #2)	Kc 0.3
Ficus robiginosa	Rustyleaf Fig	Kc 0.5
Geijera parviflora	Australian Willow	Kc 0.5
Laurus nobilis 'Saratoga'	Saratoga Sweet Bay	Kc 0.3
Olea europea Wilsoni	Fruitless Olive Tree	Kc 0.3
Quercus ilex	Holly Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3
Sapium sebiferum	Chinese Tallow Tree	Kc 0.5
Tristania conferta*	Brisbane box	Kc 0.5

**Shrubs & Groundcovers such as, but not limited to:**

Agapanthus Rancho White	White Lily-of-the-Nile	Kc 0.5
Agapanthus africanus	Lily-of-the-Nile	Kc 0.5
Agave attenuata	Century Plant	Kc 0.3
Aloe species*	Aloe	Kc 0.3
Bougainvillea species	Bougainvillea	Kc 0.3
Buxus microphylla 'Green Beauty'	Dwarf Boxwood	Kc 0.5
Callistemon citrinus Compacta	Dwarf Lemon Bottlebrush	Kc 0.3
Carissa macrocarpa Green Carpet*	Prostrate Natal Plum	Kc 0.5
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Distictus buccinatoria	Blood-Red Trumpet Vine	Kc 0.5
Echium fastuosum	Pride of Madeira	Kc 0.3
Hesperaloe parviflora	Red Yucca	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Lavendula species*	Lavender	Kc 0.3
Ligustrum japonicum 'Texanum**	Texas Privet	Kc 0.5
Limonium perezii	Sea Lavender	Kc 0.3
Mimulus auranticus*	Monkey Flower	Kc 0.3
Myrtus species	Myrtle	Kc 0.5
Nandina domestica	Heavenly Bamboo	Kc 0.5



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Phormium species	Flax	Kc 0.5
Pittosporum tobira Wheelers Dwarf*	Dwarf Tobira	Kc 0.5
Rosa species	Rose	Kc 0.5
Senecio mandraliscae	Kleinia	Kc 0.3
Strelitzia nicotia	Giant Bird of Paradise	Kc 0.5
Strelitzia reginae	Bird of Paradise	Kc 0.5
Trachelospermum jasminoides	Star Jasmine	Kc 0.5
Verbena species	Verbena	Kc 0.5
Wisteria sinensis	Chinese Wisteria	Kc 0.5
Zamia furfuracea	Cardboard Palm	Kc 0.5

**Grasses (Parkway planting) such as, but not limited to:**

Paspalum vaginatum 'Aloha'	Seashore Paspalum	Kc 0.5
Dianella species.	Flax Lily	Kc 0.5
Carex species.	Sedge	Kc 0.5
Festuca glauca	Blue Fescue	Kc 0.3
Nassella pulchra	Purple Needle Grass	Kc 0.1

**Area #6: Active Interior Recreation Areas, Pedestrian Parks & Swim Clubs**

**Trees such as, but not limited to:**

Arbutus 'Marina'	Marina Arbutus	Kc 0.5
Erythrina caffra*	Coral Tree	Kc 0.3
Olea europea Wilsoni	Fruitless Olive Tree	Kc 0.3
Quercus agrifolia*	Coast Live Oak	Kc 0.3
Quercus ilex	Holly Oak	Kc 0.3
Tristania conferta*	Brisbane box	Kc 0.5

**Shrubs & Groundcovers such as, but not limited to:**

Agapanthus Rancho White	White Lily-of-the-Nile	Kc 0.5
Agave attenuata	Century Plant	Kc 0.3
Bougainvillea species	Bougainvillea	Kc 0.3
Buxus microphylla 'Green Beauty'	Dwarf Boxwood	Kc 0.5
Callistemon citrinus Compacta	Dwarf Lemon Bottlebrush	Kc 0.3
Carissa macrocarpa Green Carpet*	Prostrate Natal Plum	Kc 0.5
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Echium fastuosum	Pride of Madeira	Kc 0.3
Hesperaloe parviflora	Red Yucca	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Ligustrum japonicum 'Texanum'	Japanese Privet	Kc 0.5
Limonium perezii	Sea Lavender	Kc 0.3
Marathon 2e	Dwarf Tall Fescue (See Note #3)	Kc 0.8
Mimulus auranticus*	Monkey Flower	Kc 0.3
Phormium species	Flax	Kc 0.5
Senecio mandraliscae	Kleinia	Kc 0.3
Strelitzia reginae	Bird of Paradise	Kc 0.5
Trachelospermum jasminoides	Star Jasmine	Kc 0.5
Verbena species	Verbena	Kc 0.5
Wisteria sinensis	Chinese Wisteria	Kc 0.5

**Grasses (Parkway planting) such as, but not limited to:**

Paspalum vaginatum 'Aloha'	Seashore Paspalum	Kc 0.5
Dianella species.	Flax Lily	Kc 0.5
Carex species.	Sedge	Kc 0.5
Nassella pulchra	Purple Needle Grass	Kc 0.1

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## Area #7: Perimeter Drought Tolerant & Fire Resistant Pedestrian Parks

### Trees such as, but not limited to:

Aloe species*	Aloe	Kc 0.3
Arbutus unedo*	Strawberry Tree	Kc 0.3
Ceratonia siliqua*	Carob Tree	Kc 0.3
Cercis occidentalis*	Western Redbud	Kc 0.3
Quercus agrifolia*	Coast Live	Kc 0.3
Quercus suber*	Cork Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3

### Shrubs & Groundcovers such as, but not limited to:

Agave attenuata*	Century Plant	Kc 0.3
Agave shawii*	Coastal Agave	Kc 0.3
Baccharis pilularis 'Twin Peaks'	Dwarf Coyote Bush	Kc 0.3
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Dalea orcuttii*	Baja Indigo Bush	Kc 0.3
Echium fastuosum	Pride of Madeira	Kc 0.3
Eriophyllum confertiflorum*	Golden Yarrow	Kc 0.1
Hesperaloe parviflora	Red Yucca	Kc 0.3
Heteromeles arbutifolia*	Toyon	Kc 0.3
Lantana montevidensis*	Lantana	Kc 0.3
Limonium perezii	Sea Lavender	Kc 0.3
Marathon 2e	Dwarf Tall Fescue	Kc 0.8
Mimulus auranticus*	Monkey Flower	Kc 0.3
Rhus lentii*	Pink Flowering Sumac	Kc 0.3
Salvia sonomensis	Creeping Sage	Kc 0.3
Sambucus species*	Elderberry	Kc 0.3
Yucca schidigera*	Mojave Yucca	Kc 0.3
Yucca whipplei*	Foothill Yucca	Kc 0.3

### Grasses (Parkway planting) such as, but not limited to:

Paspalum vaginatum 'Aloha'	Seashore Paspalum	Kc 0.5
Dianella species.	Flax Lily	Kc 0.5
Carex species.	Sedge	Kc 0.5
Nassella pulchra	Purple Needle Grass	Kc 0.1

## Area #8: Interface with Preserve

### Trees such as, but not limited to:

Cercis occidentalis*	Western Redbud	Kc 0.3
Quercus agrifolia*	Coast Live	Kc 0.3
Quercus suber*	Cork Oak	Kc 0.3
Rhus lancea*	African Sumac	Kc 0.3
Umbellularia californica*	California Bay Laurel	Kc.0.5

### Shrubs & Groundcovers such as, but not limited to:

Agave attenuata*	Century Plant	Kc 0.3
Agave shawii*	Coastal Agave	Kc 0.3
Baccharis pilularis 'Twin Peaks'	Dwarf Coyote Bush	Kc 0.3
Ceanothus species*	Carmel Creeper	Kc 0.3
Cistus species*	Rock Rose	Kc 0.3
Cotoneaster dammeri 'Lowfast'	Bearberry Cotoneaster	Kc 0.5
Dalea orcuttii*	Baja Indigo Bush	Kc 0.3
Echium fastuosum	Pride of Madeira	Kc 0.3
Epilobium californicum	California Fushcia	Kc 0.3

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Heteromeles arbutifolia*	Toyon	Kc 0.3
Mimulus auranticus*	Monkey Flower	Kc 0.3
Rhamnus californica*	California Coffeeberry	Kc 0.3
Rhus lentii*	Pink Flowering Sumac	Kc 0.3
Salvia sonomensis	Creeping Sage	Kc 0.3
Sambucus species*	Elderberry	Kc 0.3
Yucca schidigera*	Mojave Yucca	Kc 0.3
Yucca whipplei*	Foothill Yucca	Kc 0.3

**Hydroseed Mix:**

Eschscholzia californica*	California Poppy	Kc 0.3
Camissonia cheiranthifolia	Beach Primrose	Kc 0.3
Distichlis spicata	Salt Grass	n/a
Dudleya edulis	Lady's Fingers	Kc 0.3
Dudleya pulverulenta	Chalk Duleya	Kc 0.3
Encelia californica	Coast Sunflower	Kc 0.1
Lasthenia californica	Goldfields	n/a
Layia platyglossa	Tidy Tips	n/a
Lotus scoparius*	Deerweed	Kc 0.1
Lupinus bicolor*	Miniature Lupine	Kc 0.3
Sisyrinchium bellum*	Blue-Eyed Grass	Kc 0.3

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**Notes:**

1. KC = Crop Coefficient as defined by University of California Cooperative Extension, California Department of Resources "Wulcols III" report, dated August 2000.
  2. Crop Coefficient as defined by University of California Cooperative Extension, California Department of Resources "Wulcols III" report, dated August 2000.
  3. Cupressus sempervirens Strica (Italian Cypress) is permitted only within the resort developments in limited quantities. These trees must be a minimum of 100 feet away from any part of the open-space preserve.
- \* Indicates plants that are on the County of San Diego "Suggested Plant Material For Defensible Space and/or the County of Los Angeles's Fire -Wise Plant List.

# **APPENDIX J**

## ***Prohibited Plant List***





## APPENDIX J

### Prohibited Plant List

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#### Prohibited Trees

Botanical Name	Common Name	Resource
<i>Abies species</i>	Fir trees	S
<i>Acacia species</i>	Acacia	HS
<i>Agonis juniperina</i>	Juniper myrtle	S
<i>Araucaria species</i>	Norfolk island Pine	S
<i>Callistemon species</i>	Bottlebrush	H
<i>Cedrus species</i>	Cedar	HS
<i>Chamaecyparis species</i>	False cypress	S
<i>Cinnamomum camphora</i>	Camphor tree	H
<i>Conifers</i>	Evergreen trees	H
<i>Cryptomeria japonica</i>	Japanese cryptomeria	S
<i>Cupressocyparis leylandii</i>	Leylandii cypress	S
<i>Cupressus forbesii</i>	Tecate cypress	S
<i>Cupressus glabra</i>	Arizona cypress	S
<i>Cupressus sempervirens</i>	Italian cypress	S
<i>Cupressus species</i>	Cypress	H
<i>Eucalyptus species</i>	Eucalyptus	HS
<i>Eucalyptus</i>	Eucalyptus species	K
<i>Juniperus species</i>	Juniper	H
<i>Larix species</i>	Larch	S
<i>Olea europea</i>	Olive tree	H
<i>Palmae species</i>	Palms	HS
<i>Parkinsonia aculeata</i>	Mexican palo verde	K
<i>Pinus species</i>	Pine	HS
<i>Pittosporum undulatum</i>	Victorian box	K
<i>Podocarpus species</i>	Fern pine	S
<i>Prunus caroliniana</i>	Carolina cherry laurel	K
<i>Prunus lyonil</i>	Catalina cherry	K
<i>Pseudotsuga menziesii</i>	Douglas fir	S
<i>Quercus engelmannii</i>	Engelmann oak	K
<i>Quercus suber</i>	Cork Oak	K
<i>Schinus molle</i>	California Pepper Tree	H
<i>Tamarix species</i>	Tamarix	C
<i>Taxodium species</i>	Cypress	S
<i>Taxus species</i>	Yew	S
<i>Tsuga species</i>	Hemlock	S
<i>Washingtonia filifera</i>	California Fan Palm	H

## APPENDIX J (Continued)

### Prohibited Groundcovers, Shrubs, and Vines

Botanical Name	Common Name	Resource
<i>Acacia</i> species	Acacia	HS
<i>Achillea millefolium</i>	Common yarrow	K
<i>Adenostoma fasciculatum</i>	Chamise	HS
<i>Adenostoma sparsifolium</i>	Red shanks	HS
<i>Aeonium decorum</i>	Aeonium	K
<i>Aeonium simsii</i>	NCN	K
<i>Ajuga reptans</i>	Carpet bugle	K
<i>Anthemis cotula</i>	Mayweed	H
<i>Aptenia cordifolia</i> x 'red apple'	Red apple	K
<i>Arbutus menziesii</i>	Madrone	H
<i>Arctostaphylos</i> species	Manzanita	H
<i>Artemisia pycnocephala</i>	Beach sagewort	K
<i>Artemisia californica</i>	California sagebrush	HS
<i>Artemisia caucasica</i>	Caucasica artemisia	H
<i>Artemisia pycnocephala</i>	Sandhill sage	H
<i>Artemisia</i> species	Sages	H
<i>Arundo donax</i>	Giant cane	C
<i>Atriplex</i> species	Saltbush	H
<i>Atriplex canescens</i>	Four-wing saltbush	K
<i>Atriplex lentiformis</i> ssp. <i>breweri</i>	Brewer saltbush	K
<i>Baccharis pilularis consanguinea</i>	Chaparral bloom	H
<i>Baccharis pilularis</i> var. <i>pilularis</i>	Twin peaks	K
<i>Baccharis</i> species	Coyote bush	H
<i>Bambusa</i> species	Bamboo	S
<i>Bougainvillea</i> species	Bougainvillea	H
<i>Brassica nigra</i>	Black mustard	H
<i>Brassica rapa</i>	Yellow mustard	H
<i>Cardaria draba</i>	Hoary cress, perennial peppergrass	H
<i>Carpobrotus</i> species	Ice plant, hottentot fig	H
<i>Carpobrotus chilensis</i>	Sea fig ice plant	K
<i>Chrysanthemum leucanthemum</i>	Oxeye daisy	K
<i>Cirsium vulgare</i>	Wild artichoke	H
<i>Conyza canadensis</i>	Horseweed	H
<i>Coprosma pumila</i>	Prostrate coprosma	S
<i>Cortaderia selloana</i>	Pampas grass	HC
<i>Crassula lactea</i>	NCN	K
<i>Crassula multicava</i>	NCN	K
<i>Crassula ovata</i>	Jade tree	K
<i>Crassula tetragona</i>	NCN	K
<i>Cytisus</i> spp.	Scotch broom, French broom, etc.	HC
<i>Delosperma 'alba'</i>	White trailing ice plant	K

## APPENDIX J (Continued)

### Prohibited Groundcovers, Shrubs, and Vines

Botanical Name	Common Name	Resource
<i>Dodonaea viscosa</i>	Hopseed bush	S
<i>Drosanthemum floribundum</i>	Rosea ice plant	K
<i>Drosanthemum hispidum</i>	NCN	K

### Prohibited Groundcovers, Shrubs, and Vines

Botanical Name	Common Name	Resource
<i>Drosanthemum speciosum</i>	Dewflower	K
<i>Eriogonum fasciculatum</i>	Common buckwheat	H
<i>Eriogonum species</i>	Common buckwheat	HS
<i>Eschscholzia mexicana</i>	Mexican poppy	K
<i>Fremontodendron species</i>	Flannel bush	H
<i>Gaillardia x grandiflora</i>	Blanketflower	K
<i>Gazania hybrids</i>	South African daisy	K
<i>Gazania rigens leucolaena</i>	Trailing gazania	K
<i>Hedera helix</i>	English ivy	H
<i>Helix canariensis</i>	English ivy	K
<i>Heterotheca grandiflora</i>	Telegraph plant	HS
<i>Hypericum calycinum</i>	Aaron's beard	K
<i>Juniperus species</i>	Juniper	S
<i>Lactuca serriola</i>	Prickly lettuce	H
<i>Lampranthus aurantiacus</i>	Bush ice plant	K
<i>Lampranthus filicaulis</i>	Redondo creeper	K
<i>Lampranthus spectabilis</i>	Trailing ice plant	K
<i>Limonium pectinatum</i>	NCN	K
<i>Limonium perezii</i>	Sea lavender	K
<i>Lonicera japonica</i>	Japanese honeysuckle	S
<i>Lonicera japonica 'halliana'</i>	Hall's Japanese honeysuckle	K
<i>Lotus corniculatus</i>	Bird's foot trefoil	K
<i>Mahonia species</i>	Mahonia	H
<i>Malephora luteola</i>	Trailing ice plant	K
<i>Miscanthus species</i>	Eulalie grass	S
<i>Muhlenbergia species</i>	Deer grass	S
<i>Nerium oleander</i>	Oleander	K
<i>Nicotania bigelovii</i>	Indian tobacco	H
<i>Nicotania glauca</i>	Tree tobacco	H
<i>Ophiopogon japonicus</i>	Mondo grass	K
<i>Osteospermum fruticosum</i>	Trailing African daisy	K
<i>Penstemon spectabilis</i>	Beard tongue	K
<i>Pennisetum setaceum</i>	Fountain grass	C

## APPENDIX J (Continued)

### Prohibited Groundcovers, Shrubs, and Vines

Botanical Name	Common Name	Resource
<i>Perovskia atriplicifolia</i>	Russian sage	H
<i>Pickeringia 'montana'</i>	Chaparral pea	S
<i>Plantago sempervirens</i>	Evergreen plantain	K
<i>Portulacaria afra</i>	Elephant's food	K
<i>Potentilla tabernaemontani</i>	Spring cinquefoil	K
<i>Rhamnus alaternus</i>	Italian buckhorn	K
<i>Rhus diversiloba</i>	Poison oak (worker/firefighter safety)	H
<i>Rhus laurina</i>	Laurel sumac	H
<i>Rhus lentii</i>	Pink flowering sumac	H
<i>Ricinus communis</i>	Castor bean	H
<i>Romneya coulteri 'white cloud'</i>	White cloud matilija poppy	K

### Prohibited Groundcovers, Shrubs, and Vines

Botanical Name	Common Name	Resource
<i>Rosmarinus species</i>	Rosemary	S
<i>Salsola australis</i>	Russian thistle	H
<i>Salvia mellifera</i>	Black sage	S
<i>Salvia species</i>	Sage	H
<i>Sedum acre</i>	Goldmoss sedum	K
<i>Sedum album</i>	Green stonecrop	K
<i>Sedum confusum</i>	NCN	K
<i>Sedum lineare</i>	NCN	K
<i>Sedum x rubrotinctum</i>	Pork and beans	K
<i>Senecio serpens</i>	NCN	K
<i>Solanum xanthii</i>	Purple nightshade (toxic)	H
<i>Silybum marianum</i>	Milk thistle	H
<i>Tamarix spp.</i>	Tamarisk	K
<i>Tecomaria capensis</i>	Cape honeysuckle	K
<i>Thuja species</i>	Arborvitae	S
<i>Trifolium hirtum 'hyron'</i>	Hyron rose clover	K
<i>Trifolium fragiferum 'o'connor's</i>	O'Connor's legume	K
<i>Urtica urens</i>	Burning nettle	S
<i>Verbena species</i>	Verbena	K
<i>Vinca major</i>	Periwinkle	H
<i>Vinca minor</i>	Dwarf periwinkle	K
<i>Vulpia myuros 'zorro'</i>	Zorro annual fescue	K
<i>Yucca species</i>	Yucca	K



## APPENDIX J (Continued)

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### EXCEPTIONS

1. The use of palm trees is prohibited within any Vegetation Management Zones, however Palm trees may be permitted within the interior of the development (in moderation), with prior approval from the San Diego County Fire Authority (SDCFA). Proper spacing, irrigation and maintenance required.
2. Bougainvillea species may be used in certain interior areas (in very moderate amounts), with prior approval from the SDCFA.

### NOTES:

Various documents are referenced as sources for plant material information in this list of prohibited plant material. The titles of some of those reference documents suggest that some of the plant materials may be somewhat “Fire Retardant.” It must be understood that under various fire conditions, all plant materials will burn. Accordingly, some seemingly “Fire Retardant” plants appear in this Prohibited Plant List.

Plant species included on this Prohibited Plant List that also occur on the Landscape Concept Plan may be used in limited quantities in interior locations, with approval of the SDCFA.

“Fire Resistant.” Others are documented as “High Fire Risk.” Notwithstanding any other descriptors, the preparers of this document have determined that plants in this Prohibited Plant List shall not be used within the Brush Management Zones within this project.

All vegetation used in Vegetation Management Zones and elsewhere in this development shall be subject to approval of the County Fire Marshal.

Any deviations from the Prohibited Plant List must be submitted to the County Fire Marshal for approval

### SOURCES:

#### C:

City of Chula Vista, Fire Retardant and/or Drought Tolerant Plant List, Landscape Manual, November 1994

#### H:

Hunt Research Corporation Report, Otay Ranch, Village 7/2 - Fire Protection Plan, June 14, 2005

## **APPENDIX J (Continued)**

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**S:**

County of San Diego, Suggested Plant List for Defensible Space,  
<http://www.sdcountry.ca.gov/dplu/dos/UndesirablePlants.pdf>

**K:**

Appendix K, City of Chula Vista MSCP Subarea Plan: San Diego County Fire Chief's  
Association Fuel Modification Zone Plant List, July 15, 1997